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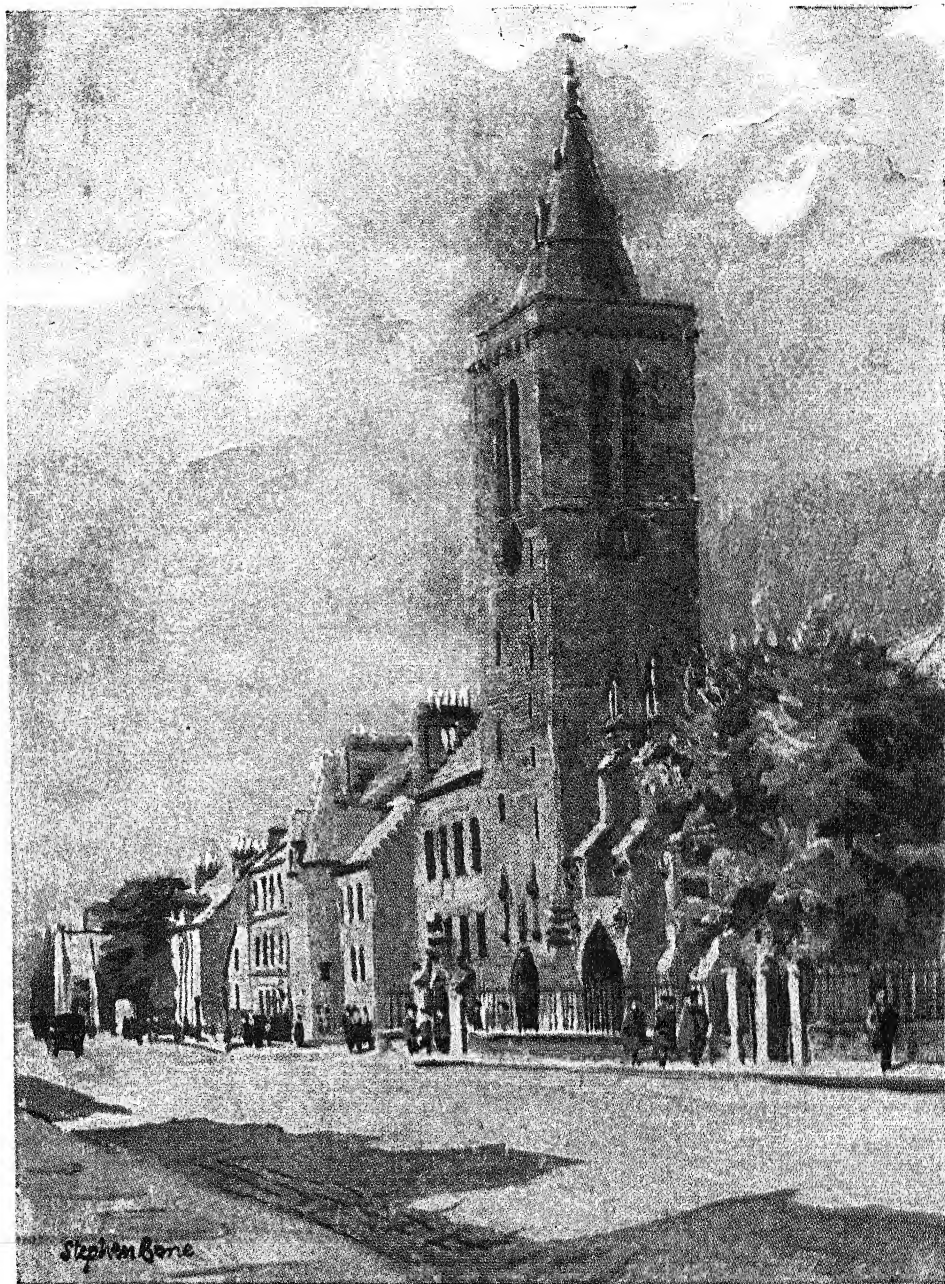
The New
UNIVERSAL
Encyclopedia



Volume 9



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Specially painted for the New Universal Encyclopedia by Stephen Bone

ST. ANDREWS UNIVERSITY, oldest in Scotland, preserves a few of its original buildings. In this picture the scarlet gowns of students contrast with the grey stones of the 15th century chapel of United College (St. Salvador, 1450, and St. Leonard, 1512 ; united 1747)

The New UNIVERSAL Encyclopedia

Edited by

Sir John Hammerton

*Editor of The Universal History of the World,
The Second Great War, etc.*

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RHEU—SUCC



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Volume 9

Rheumatic Fever. Acute disease due to an infective agent not yet isolated. Organisms which have been stated to be the cause have proved to be due to some superimposed condition. Children and young adults are most commonly affected. There is some hereditary tendency to the disease, and exposure to cold or wet is often the precipitating factor. The symptoms generally begin abruptly, but may have been preceded by pains in the joints, sore throat, and inflammation of the tonsils. The temperature rises to 102° F. or more; then in a few days one or more of the joints become swollen, hot, painful, and reddened. Usually one of the large joints is affected first. The knee and ankle are the joints most frequently affected, but any joint may be involved. As the symptoms subside in one joint they may appear in another. There may be a reddish rash on the skin. Involvement of the heart is a frequent and serious complication. In many cases small nodules of about the size of a pea appear under the skin.

The course of the disease is very variable, and the convalescence must necessarily take several months. A fatal termination is rare, but permanent disease of the heart is very apt to remain, the organism having a special affinity for the mitral valve of the heart, causing this to contract in later years by the formation of fibrous tissue. There may also be changes in the joints. The essential feature in the treatment is to keep the patient at rest, so as to diminish the strain on the heart. The diet should be light. The affected joints should be wrapped in cotton-wool, and when the pain is severe hot cloths saturated with an anodyne lotion should be applied to them. Fixation of the joints with padded splints often gives relief. As internal medicines, salicin or salicylates in large doses are effective.

Rheumatism (Gr. *rheumatismos*, flux or rheum). Term popularly used for painful affections of the muscles or joints. The cause of rheumatism, and of the pain is unknown. Sepsis may play a part, as may worry and anxiety. Salicylates are the best remedy. Acute rheumatism is equivalent to rheumatic fever (*v.s.*). Originally, the word denoted a catarrh or flow of rheum.

Rheumatoid Arthritis OR **ARTHRITIS DEFORMANS** OR **POLY-ARTHRITIS**. Disease of the joints in which inflammation spreads

from the surrounding fibrous tissue to the structure of the joint itself causing destruction of the parts. There are two types—the idiopathic or “classical” type, of which the causation is unknown, and the infective type caused by a definite infective agent. The disease is commonest among women, rarely occurring after the menopause. In most cases fatigue, mental and physical, and loss of weight, precede the onset. The condition often starts in the bones of the hands, accompanied by wasting of the muscles, spreading eventually to the other joints in bilateral and symmetrical march. The joints may become stiff, ankylosing through destruction of the mechanism. Sometimes the disease arrests itself for no recognizable reason, and it is invariably held up by pregnancy.

Only some cases show any response to treatment. The general health must be maintained, and the diet must be rich in vitamins. Physiotherapy is helpful, easing pain. Splinting may be necessary to prevent deformity. Guaiacol, thyroid extracts, iodine and gold injections have been used and cortisone gives relief. Above all, septic foci must be sought for and dealt with.

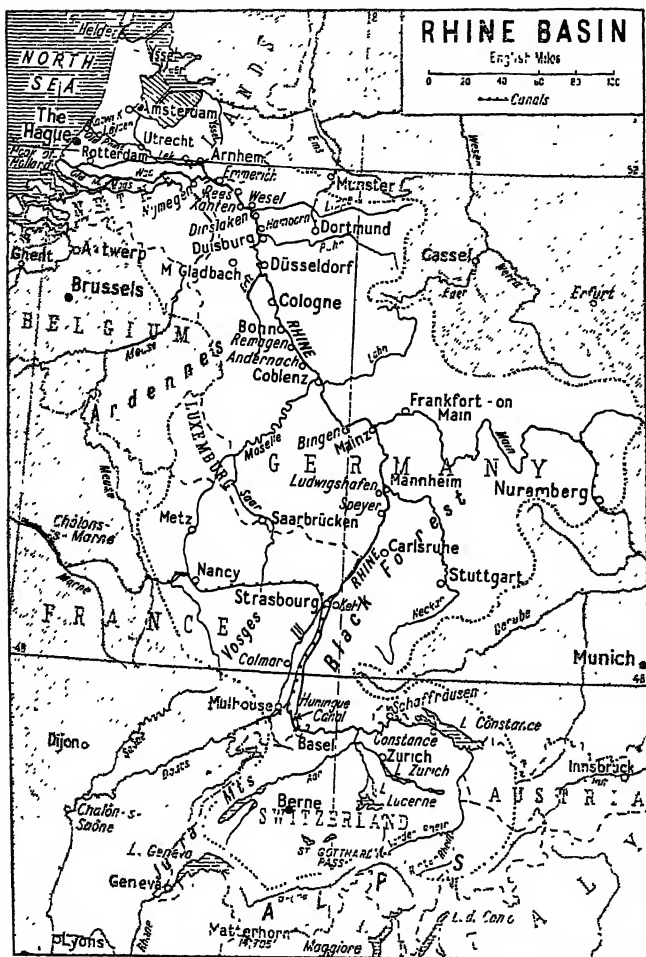
Rheydt. Tn. of W. Germany, in N. Rhine-Westphalia on the Niers, 20 m. W. of Dusseldorf. It possesses a fine Renaissance palace of 1567, but became a town only in the 1800s with the development of a textile industry. It also had a considerable electrical and printing industry, several impressive churches and a fine town hall, but was heavily damaged by bombs during the Second Great War. United with the neighbouring town of Gladbach from 1929 to 1933, it was re-established as a separate town upon the demand of Goebbels, who was born in Rheydt, and secured for himself its palace which had once belonged to the Juliers dynasty. Captured by the U.S. 9th army, March 1,

1945 in severe fighting, it lay in the British zone of occupation after Germany's surrender. Pop. (1939) 77,263.

Rh Factor. Agglutinin group factor present in red blood cells, so called because of its relation to blood of the rhesus (*q.v.*) monkey. Landsteiner and Wiener in 1940 noted that injection of blood from rhesus monkeys into rabbits or guinea-pigs led to the development of antibodies which reacted not only with the red blood cells of those monkeys but also with the cells of 85 p.c. of the white population; such persons were termed Rh positive and the remaining 15 p.c. Rh negative. When Rh factor is introduced into the blood of an Rh-negative person, *e.g.*, by a transfusion of Rh-positive blood, the production of anti-Rh agglutinins is stimulated, and any further addition of Rh is likely to produce severe reaction. In the case of an Rh-negative woman in pregnancy Rh factor may be introduced through the placenta from an Rh-positive foetus, the Rh agglutinin being inherited from the Rh-positive father. The opposite condition may result in the death of the baby. Sensitisation of patients during blood transfusions may be avoided by determining the Rh index and finding Rh-negative donors for Rh-negative recipients. In ante-natal clinics Rh tests make it possible to detect in advance the likelihood of complications due to Rh phenomena, so that necessary precautions can be taken. The Rh factor appears to be not a single substance but a mixture, and the erythrocytes of an Rh-positive person may contain one or more than one of these.

Rhine (Ger. *Rhein*; Fr. *Rhin*; Dutch, *Rijn*). Largest and most intensely navigated river of W. Europe. It is 820 m. long and rises in Switzerland, with two headstreams, the Vorderrhein on the St. Gotthard, at a height of 7,735 ft., the Hinter-Rhein near the Bernardino pass, from a glacier at a height of 9,570 ft., flows along the Swiss, Austrian, and German borders through the lake of Constance and, near Schaffhausen, plunges over an 80-ft. fall before reaching Basel. From Basel, where its E.-W. course turns N., it is navigable to Strasbourg for vessels up to 1,300 tons, from there to Mannheim up to 2,500 tons, and from Mannheim to its mouth (453 m.) up to 4,000 tons.

Its width varies, from 220 yards at Basel to 630 at Mainz, 410 at



Rhine. Map of the territory drained by the river, including part of the basin of the Maas

Bonn, 570 at Cologne, 1,060 at Wesel. Inside the Netherlands it turns W. once more and splits into a number of branches; the broadest, called the Waal and then (after being joined by the Maas river) Old Maas and New Maas, enters the North Sea S. of Overflakkee; another branch called the Rijn at Arnhem, then the Lek, then the Maas, enters the North Sea as the Scheur at the Hook of Holland; this branch has itself a branch, called the Old Rhine, which flows past Utrecht and Leyden and enters the North Sea at Katwijk. Still another branch flows as the Yssel in the bed of a canal dug in the time of the Roman emperor Drusus, from just E. of Arnhem into the Yssel Meer (formerly into the Zuider Zee). Of its total course, 430 m. are in Ger-

many or on the German frontier (113 m. with France, 5 m. with the Netherlands), 108 m. are in the Netherlands; and, taking the longer of the two headstreams, 282 m. in Switzerland.

Along the course of the Rhine lie a number of great inland ports: Basel, also on the Huningue canal; Strasbourg-Kehl, at the junction with the river Ill and the Rhine-Rhône canal; Mannheim, with the Neckar; Mainz, with the Main; Coblenz, with the Moselle and Lahn; Cologne; Düsseldorf, with the Erft; Duisburg-Hamborn, formerly the largest inland port of Europe, with the Ruhr; Wesel, with the Lippe; and Rotterdam, on the outlet of the Lek called the Maas. The Midland canal links Duisburg, Wesel, and Emmerich

and the Weser; the Dortmund-Ems canal goes to the North Sea via the river Ems; the Rhine-Main-Danube canal links the two great fluvial systems of central Europe; and the Rhine-Marne and Rhine-Rhône canals connect French waterways with the Rhine. Before the Second Great War the load carried by the Rhine averaged about 8.3 million mile-tons per year, or 60 p.c. of Germany's inland water traffic. It consisted of ore, grain, petroleum, other raw materials upstream, and coal, Alsatian potassium, building materials, and industrial products downstream; and there was a good deal of passenger traffic, the journey on board German or Dutch steamers, especially along the middle course from Bingen to Cologne, offering most attractive scenery with green, vine-covered hills, romantic castles and ruins, and old, picturesque towns and villages.

A Major Trade Route

The Rhine, originally the border line between Celts and Germans, was a trade route in Roman days. Minor sovereigns and robber barons beset it, from their castles, in the Middle Ages, exacting toll from the passing ships, a custom abolished in 1803 under French pressure. In 1868 the Rhine Shipping Act placed the river under the combined authority of the nations sharing its course: the Versailles Treaty, 1919, Articles 354-55, merely amplified this agreement, establishing Strasbourg as seat of its control commission, in which the U.K., Italy, and Belgium as well as the countries along its course were represented. There are special Rhine shipping courts for litigation concerning navigation, power stations, etc.

SECOND GREAT WAR. The Rhine was the last great barrier which the Allies had to pass from the W. to reach the heart of Germany; and it was in order to overcome it rapidly by outflanking the Siegfried line, which stopped at the Netherlands frontier just S. of Arnhem, that Eisenhower decided to carry out an airborne attack on Grave, Nijmegen, and Arnhem in Sept., 1944. This action, though partially successful, failed in its object; and a frontal attack on the Siegfried line became necessary. The Allied command therefore decided first to open the Scheldt estuary, in order to make the port of Antwerp usable, and then to line up along the W. bank of the Rhine from its mouth at least as far S. as Düsseldorf before again attempting to cross it.

The Germans occupying the N. bank of the Scheldt estuary were overcome by Nov. 9, and a channel to Antwerp was swept clear of mines by the 26th.

By that time the Rhine had in fact been reached, by the French 1st army in the S. on Nov. 20 between Mulhouse and the Swiss frontier, and by the U.S. 7th army (with the French 2nd armoured div. leading) at Strasbourg, Nov. 23. Fighting continued in this area, however, particularly around Colmar, and it was Feb. 9, 1945, before organized resistance ceased. On Dec. 3, 1944, the Germans breached the S. bank of the Rhine just below Arnhem, flooding the ground between the Rhine and the Waal, and compelling the Canadians to withdraw from their forward positions there. Then on Dec. 16 came the German counter-offensive in the Ardennes. Reorganization and redeployment of the Allied forces ready for the attack on the Siegfried line were interrupted. By the beginning of Feb. the Allies were re-established along the line they had held before the German counter-offensive, and on the 14th the Canadian 1st army reached the Rhine opposite Emmerich. The U.S. 9th army cleared München-Gladbach on March 1; German resistance on the Cologne sector collapsed and Cologne, in ruins, was captured March 7. By the 10th the Allies were along the Rhine as far S. as Düsseldorf.

Bridge at Remagen Seized

Farther S. still the U.S. 1st army reached the river at Remagen March 7, and there found intact, and seized, the Ludendorff rly. bridge, the sole bridge left standing by the Germans along the whole length of the Rhine. Five U.S. divs. were put across, and although the country was difficult, by the 24th the Americans held an area 25 m. long by 10 m. deep. The U.S. 3rd army reached the Rhine at Andernach 15 m. N.W. of Coblenz on March 9 and, sweeping southwards across the Moselle on the 15th, cleared the W. bank of the Rhine as far as Bingen by the 19th. On the 22nd this army also made a crossing by night with unexpected ease. By the 25th resistance W. of the Rhine was at an end: the Ardennes campaign had delayed the Allied attack by some six weeks; but it had also exhausted all German defensive reserves.

The major crossing remained the task of Montgomery's 21st army group, composed of the British 2nd, the Canadian 1st, and the U.S. 9th armies. The Rhine in the

stretch to the N. of Düsseldorf chosen for the operation is 600–700 yds. wide, has a depth of 20–30 ft., and a current of 3–5 m. an hr. British and U.S. naval detachments, dressed for secrecy as soldiers, dragged 200 m. overland across the Netherlands L.C.M.s and L.C.V.P.s (see Landing Craft) to be used as ferries for transporting across the river tanks, guns, and bulldozers. Dense and continuous smoke screens hid the final preparations. The assault began at 9 p.m. on March 23 in bright moonlight. In the course of the night, assault troops crossing in "buffaloes" and other amphibious craft established bridgeheads on the heavily mined E. bank at Rees, opposite Xanten, at Wesel, and near Dinslaken. Early on the morning of the 24th more than 3,000 transport aeroplanes operating from 26 British and continental bases dropped parachutists of the British 6th and U.S. 17th airborne divs. N. and N.E. of Wesel, within range of covering artillery. This, the largest airborne operation of the war, was completely successful. British engineers had constructed a bridge by 11.30 p.m. of the 24th, and 24 hrs. later seven bridges were in operation to the bridgehead which by that time had been extended to a width of 25 m. and a maximum depth of six m.

Rhineland. Name for an area of Germany demilitarised "for ever" under the Versailles treaty, comprising all of Germany W. of the Rhine and a strip 30 m. wide on the E. On March 7, 1936, the area was remilitarised by German forces as Hitler's first great act of repudiation of the treaty.

Rhineland-Palatinate. *Land* or state of the Federal Republic of W. Germany, in the French zone of occupation. Created in 1946, it comprises the S. half of the former Rhine province, the former (Bavarian) Palatinate, and the part of former Hesse W. of the Rhine; the Saar basin is not included. The capital is Mainz.

Rhine-Marne Canal. Waterway of France. Constructed during 1838–53, it runs from the canalised Ill at Strasbourg to Vitry-le-François on the Marne, where it joins the canal running alongside that river. It is 225 m. in length, can take ships up to 250 tons, has 150 locks and four tunnels up to three m. long, and is carried across the Meurthe, Moselle, and Meuse.

Rhine Province. Former S.W. prov. of the German state of Prussia. Including the Saar, it had an

area of 10,035 sq. m. It stretched along both banks of the Rhine, between Lorraine, Luxemburg, Belgium, and the Netherlands in the S. and W., Hesse-Nassau and Westphalia in the E. and N., and contained the best vineyards of the Rhine, Main, Moselle, and Saar, part of the industrial area of the Ruhr, and, in addition to its largest city, Cologne, had 12 towns of between 100,000 and 700,000 inhabitants. Chief industries were mining, engineering, and the manufacture of textiles and chemicals; most of the people, of Frankish origin, were R.C.; and a large part of the area was long ruled by archbishop-electors. The capital was Coblenz.

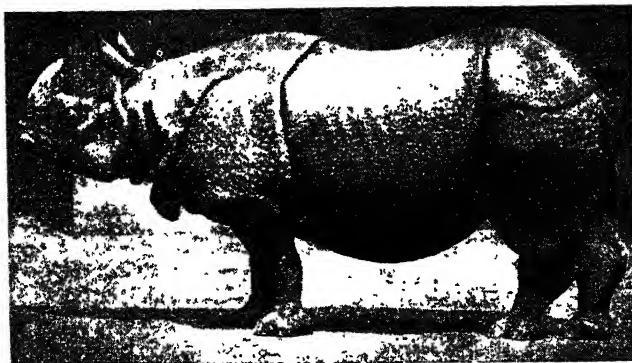
After the surrender of Germany in 1945, the prov. was split, the S. half coming under French occupation and forming part of the Rhineland-Palatinate *Land*, while the N., occupied by the British, was united with Westphalia to form the *Land* of North Rhine-Westphalia.

Rhine-Rhône Canal. Waterway of France. Starting from St. Symphorien, on the river Saône, it passes S.E. to the Doubs, which it follows until it passes S. of Belfort to Mulhouse and enters the Rhine basin. From Mulhouse it passes N. to Strasbourg. Built 1783–1834, it is 193 m. in length.

Rhinitis (from Gr. *rhis*, nose). Inflammation of the mucous membrane of the nose. Acute catarrhal rhinitis may be the familiar cold in the head, or may be caused by irritating gases, dust, or pollen of plants, catarrh due to the last being spoken of as hay fever.

Chronic rhinitis occurs in two forms. In the hypertrophic form there is thickening of the tissues covering the bones in the inside of the nose, which may cause some obstruction to respiration. In dry chronic rhinitis there is little discharge, and the exudation dries and forms crusts on the tissues.

Rhinoceros (Gr. *rhinos*, of the nose; *keras*, horn). Genus of large ungulate mammals, confined to Central and S. Africa and S. Asia, and once common in Europe, including Great Britain. Five species are usually recognized, of which three occur in Asia. Their most obvious distinction from all other mammals is the presence of one or two horns in the middle line of the face. But these are not horns in the same sense as those of the ox. They have no connexion with the bones of the skull, but consist of agglutinated masses of horny fibres or hairs growing out



Rhinoceros. One-horned species found in Indian jungles, distinguished by its thick folds of skin, resembling plates of armour

Gambier Bolton, F.Z.S.

of the skin. The rhinoceros belongs to the odd-toed group of ungulates, or hoofed mammals, and has three sub-equal toes on each foot and no projecting snout.

The Indian rhinoceros has one horn, and is distinguished by the thick tuberculed skin, which is folded in places and has something of the appearance of an ancient coat of plate armour. It stands a little over five feet high at the shoulder, and is of very heavy and clumsy appearance. It is found in swampy spots in the jungle, and is usually timid and inoffensive. It has been known to live over 50 years in captivity, and in a wild state it probably completes its century. The Javan and Sumatran rhinoceroses are smaller in size, and the skin is smooth and inclined to be hairy. The latter species has two horns, usually short.

The black rhinoceros is a native of Africa, and ranges from Abyssinia to Cape Colony, being usually found in thickets near streams. It has two horns, and the skin is smooth and almost hairless. The upper lip is prolonged and pointed, and, being somewhat prehensile, is used for grasping the leaves and twigs on which it chiefly feeds. Notwithstanding its great bulk, it is agile, and usually makes off with great speed when alarmed.

The white rhinoceros is the largest of all, and sometimes attains a height of over six feet at the shoulder. It lacks the pointed upper lip of the black species, and has a tuft of hair at the tip of each ear. The front horn is sometimes about a yard long, the other being much shorter. It occurs in the S. Sudan, the Congo Free State, and S. of the Zambezi river. It feeds entirely upon grass, is usually found in pairs, and is very dangerous if molested. See Animal; Ice Age.

Rhizomes. Underground stems which grow horizontally. From them adventitious roots penetrate downwards into the soil, and leaves (e.g. *Oxalis*) or stems bearing leaves (e.g. *Solomon's seal*) rise into the air. They may branch, so that one plant may form several apparently separate aerial growths. Older parts of rhizomes tend to decay, so that branches actually become separate individuals by vegetative reproduction. Many rhizomes (e.g. *Iris*) continue to live while their aerial growths die down, the food stores in the rhizome serving for the annual renewal of the aerial growths.

Rhizopoda (Gr. *rhiza*, root; *pous*, foot). Word used by zoologists for the class which includes the lowest members of the protozoa or primitive animals. It includes such organisms as the amoeba, radiolaria, and mycetozoa. They are usually of amoeboid form.

Rhode Island. State of the U.S.A. One of the original thirteen, it is the smallest state, its area being 1,214 sq. m., only a little larger than Gloucestershire; of this 156 sq. m. is inland water. The surface is level in the S., with plains and swamps along the coast, but hilly in the N. and E. Narragansett Bay extends inland for 30 m., and contains several islands, one of which gives the state its name. There are several summer resorts, of which the most notable is Newport. Some farming is carried on, but the main industrial interest of Rhode Island are its manufactures. It is the most densely populated state of the union, and was the birthplace of the American textile industry. It is still the greatest jewel-manufacturing community in the world, and there is a considerable machine-tool industry. Providence is the

capital; other large towns are Pawtucket and Woonsocket.

Various settlements were made during the 16th century in what is now Rhode Island, chiefly by persons exiled for religious reasons from Massachusetts, and the descendants of these dissenters own the great fortunes of the state to-day. In 1647 the four existing settlements of Providence, Portsmouth, Newport, and Warwick were united. In 1663 a royal charter was obtained; as the war of independence loomed ahead, Rhode Island refused to attend the constitutional convention of 1787, carrying on internal administration under its colonial charter until 1842. It attracted in the 19th century large numbers of Irish immigrants, and by the 1940s virtually the entire upper judiciary, the mayors of Providence and Newport, and Rhode Island's leading figures in Washington (the state sends two senators and two representatives to congress) were of Irish descent. Pop. 713,346. Consult Rhode Island: Three Centuries of Democracy, C. Carroll, 1932.

The Rhode Island Red breed of poultry is described under Fowl.

Rhodes (Gr. *Rhodos*). Most easterly island in the Aegean Sea, sometimes included in the Dodecanese (*q.v.*).

A Greek possession, it lies 12 m. S. of the coast of Asia Minor and is 43 m. long and 20 m. wide, covering 545 sq. m. The N. is fertile, the S. elevated, so that during the rainy winter season torrents rush down the slopes to the sea. The principal products are grapes, oranges, wine, onions, tobacco, soap, and kaolin. Pottery is made.

Known under various names in ancient times, the island was called Rhodos, probably from its extensive cultivation of roses (Gr. *rhodon*). The oldest inhabitants were the mythical Telchines, who were succeeded by Phoenicians and Dorian immigrants from Argos. Its three chief towns, Lindus, Ialysus, and Camirus—with Cnidus and Halicarnassus in Asia, and the island of Cos—formed what was known as the Doric hexapolis, or league of six cities. The island rapidly became flourishing, founded Gela in Sicily and other colonies, but first acquired political importance when the three towns in 408 B.C. built a new city called Rhodos, which became the capital.

Alternately attached to Athens and Sparta, it lost its independence in the time of Alexander the Great, regained it after his death,

and soon became a thriving commercial centre. Its code of maritime laws was later adopted by the Romans and through them by modern Europe. Science and art flourished. The Rhodian school of rhetoric, distinguished by its florid style, and originally founded by Aeschines (*q.v.*), was attended by Cicero. Its school of art was founded by Chares of Lindus, who fashioned the bronze statue of Helios (*see* Colossus). Other representatives were Athenodorus (*see* Laocoon) and Apollonius and Tauriscus of Tralles, who executed the group known as the Farnese bull (*see* Dirce).

For their loyal support of Rome during her wars against the Seleucid emperors of the East, the Rhodians were rewarded with mercantile privileges and a considerable increase of territory, which later were partly taken away owing to their suspicious attitude. Yet

40,000 surrendered to the 9,000 Germans in the island following a savage German dive-bombing attack from Crete, Sept. 8, and Rhodes remained under German control until the surrender of all Germans in Rhodes and the Dodecanese at Symi Island, May 9, 1945. Under the peace treaty with Italy, 1947, Rhodes passed to Greece. Pop. 61,886.

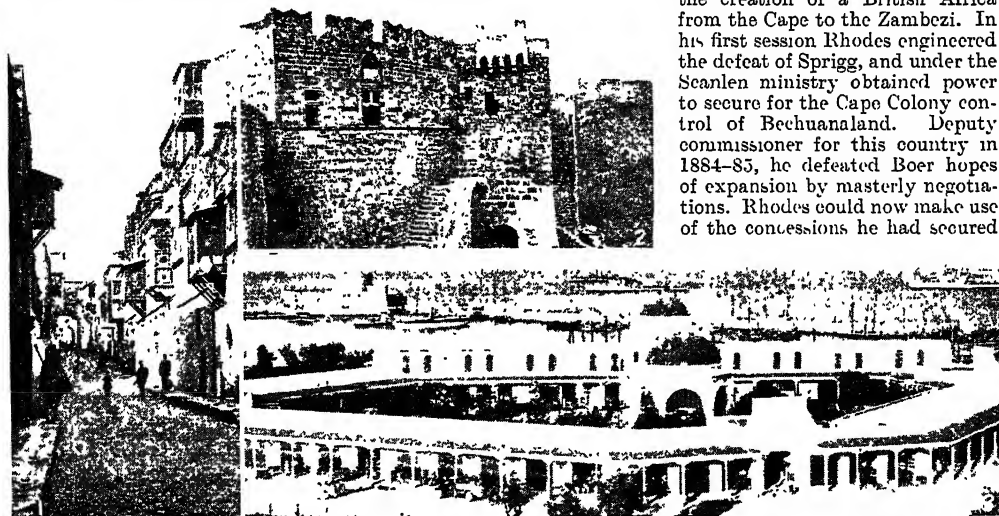
Rhodes. Capital of the island of Rhodes. Situated in the N.E. corner of the island, it is a port of call for Levant steamers. Its principal interest is in the remains of the Knights Hospitallers. Among these are the castle; the Street of the Knights, which contains remains of the houses of assembly of the Knights Hospitallers, several bearing armorial devices of the countries to which the inmates belonged; and the Grand Hospital of the Knights, restored by the Italian government and con-

plantation. They developed two separate mines or pipes—De Beers and Kimberley—which were a maze of individual claims. The necessity of amalgamating these brought Rhodes to the front, and after a long financial conflict with Barney Barnato, he amalgamated the mines under the name of De Beers in 1889.



C. J. Rhodes
W. & D. Douney

Between activities at Kimberley Rhodes found time to keep his terms at Oriol College, Oxford, graduating in 1881. That year he joined the Cape parliament as member for Kimberley. He entered it with a plan already formed in his mind, no less than the creation of a British Africa from the Cape to the Zambezi. In his first session Rhodes engineered the defeat of Sprigg, and under the Seamen ministry obtained power to secure for the Cape Colony control of Bechuanaland. Deputy commissioner for this country in 1884-85, he defeated Boer hopes of expansion by masterly negotiations. Rhodes could now make use of the concessions he had secured



Rhodes. Scenes in the historic capital of the Aegean island. 1. Street of the Knights, containing the old houses of the Knights Hospitallers. 2. Entrance to the castle. 3. The market

the island enjoyed semi-independence until the time of Vespasian, when it was merged in the province of Asia. Later included in the Byzantine empire, from 1309 to 1523 it was the headquarters of the Knights Hospitallers, being captured at last by the Turks.

The island, occupied by Italy during the Italo-Turkish War of 1912, was transferred to her by the treaty of Lausanne, 1924.

Rhodes was subjected to periodical naval and aerial bombardment by the Allies after Italy entered the Second Great War, 1940. When Italy surrendered to the Allies, 1943, the Italian garrison of

verted into a museum in 1914. Rhodes is the seat of an R.C. archbishopric and has law courts, and was Count Bernadotte's h.q. as Jewish-Arab mediator, 1948. Population 27,466.

Rhodes, CECIL JOHN (1853-1902). British coloniser and administrator. He was a son of the vicar of Bishop's Stortford, where he was born July 5, 1853. Educated at the grammar school, he was sent at 17 for the benefit of his health to Natal, where his eldest brother, Herbert, was planting cotton. They joined the diamond diggers on the banks of the Vaal after winding up the cotton

from Lobengula, chief of the Matabele. In 1889 he obtained from the imperial government a royal charter for the British South Africa Company, and pushed forward the well-organized expedition which took peaceful possession of Mashonaland.

In 1893, raids by the Matabele on the Mashona brought about a war, in which the latter tribe was defeated and a territory as large as France and Germany combined came under the administration of the company. President Kruger was now surrounded by British territory except for Delagoa Bay, which Rhodes had failed to pur-

chase from the Portuguese. Prime minister of the Cape since 1890, Rhodes was pressing the colony to extend its rly. system to Pretoria, and effect a rly. and customs union with the Transvaal. But the parliament refused, and the wealth of the newly discovered goldfields enabled Kruger to build his line to Delagoa Bay and punish the Colony for its exorbitant customs policy; but he carried matters too far when he "closed the drifts" to Cape merchandise and produce. This action ranged the Colony behind Rhodes.

Remembering his bloodless successes, Rhodes concentrated the Rhodesian police near the Transvaal frontier. Kruger gave way on the Drifts question, but refused any concessions to the Uitlanders. Then came the episode of the Jameson Raid (*q.v.*); Rhodes's connivance was proved; and although on Jan. 2, 1896, the day of Jameson's surrender, he tendered his resignation as prime minister, and shortly afterwards resigned his managing directorship of the Chartered Company, he was severely censured by both his own and the British parliaments. He found work and solace in the task of quelling a Matabele rebellion which had broken out upon the news of Jameson's defeat. With no authority and no backing, except moral power, he went to the Matoppo and there negotiated a peace with the chiefs.

He went back to encourage industrial development in Rhodesia; and in 1897 justified past policy on the ground that Kruger had denied the majority of the population any share in government. But this great question had to be settled by arms. At the outbreak of war Rhodes at Kimberley helped to organize the defence. Hardship helped to break down his strength, and after a painful illness he died March 26, 1902. He was buried in the Matoppo Hills.

In his imperialism Rhodes was at once a visionary and a man of impulsive action. He attempted too much and left it undone, yet the prosperity of Rhodesia witnesses his work as a founder of the British Empire. Though a financial genius, he was probably not personally interested in the fortune he acquired; but he failed to realize that subordinates were not always selfless. He would not have understood Edith Cavell's phrase, "patriotism is not enough," when it came to justifying the unconventional if brave decisions he took.

Rhodes left Groote Schuur, his house on Table Mountain, to be a residence for future prime ministers. His memorials are the buildings at Cape Town including the sculpture, *Physical Energy*, by Watts; Rhodes House in Oxford, designed by Sir H. Baker and opened in 1929; and the Rhodes Trust (*q.v.*) at Oxford university. Among many biographies may be named those by L. Michell, 1910; T. E. Fuller, 1910; A. F. B. Williams, 1921; W. Plomer, 1933; S. G. Millin, 1933; H. Baker, 1934; J. G. McDonald, 1934; J. G. Lockhart, new ed. 1946. There is an unsympathetic sketch of Rhodes in F. B. Young's novel, *City of Gold*. In a film, *Rhodes of Africa*, 1936, Walter Huston took the part.

Rhodes, JAMES FORD (1848-1927). American historian. Born at Cleveland, Ohio, May 1, 1848,



J. F. Rhodes,
American historian

he was educated at the universities of New York and Chicago, and in Paris. Paris correspondent of *The Chicago Times*, he gave up this post to enter the iron and steel business. From 1885 he was able of devote himself to the study of history. He worked on a *History of the United States from the Compromise of 1850*; eight volumes, carrying the story down to 1877, appeared 1893-1917, and a full edition in 1920. Written with marked impartiality, it is the best account of the eventful period of the civil war. In 1899 Rhodes was president of the American Historical Association. He also wrote *Historical Essays*, 1909. He died Feb. 22, 1927.

Rhodes, WILFRED (b. 1877). English professional cricketer. Born Oct. 29, 1877, at Kirkheaton, this Yorkshireman was a mainstay of his county side for 30 years from his first appearance as a slow bowler in 1899, but is chiefly remarkable for his career in England teams against Australia. He began as a bowler, batting last: at his prime he went in first with J. B. Hobbs, the pair at Melbourne in 1912 making an unprecedented



Wilfred Rhodes,
English cricketer

opening stand of 323; recalled as a bowler for the Oval test match in 1926, Rhodes was a chief figure in England's victory. No player equalled his tally of 109 Australian wickets in tests. He headed the bowling averages in seven seasons including 1926, when aged 48; each year 1900-01-02 brought over 200 victims to his skill and in 1909 and 1911 he passed 2,000 runs and 100 wickets. In seventeen seasons he achieved the all-rounder's "double" of 1,000 runs and 100 wickets, another record.

Rhodesia. Name given, in honour of Cecil Rhodes (*q.v.*), to the area of central Africa lying between Angola, the Belgian Congo, Tanganyika Territory, Mozambique, the prov. of Transvaal, and the Bechuanaland protectorate. The whole area was for more than 30 years under the administration of the British South Africa Co., chartered 1889. Southern Rhodesia became a British colony in 1923; Northern Rhodesia, created in 1911 out of the two provs. of N.E. and N.W. Rhodesia, became a British protectorate in 1924. For an account of their history and physical and other features, see Northern Rhodesia; Southern Rhodesia. For map, see Southern Rhodesia.

Rhodesian Regiment, ROYAL. British colonial regiment. Developed from the British South Africa Company's native police force formed in 1889, the unit was known until 1933 as the Northern Rhodesia Police. It had civil and military sections, the latter serving with the British army in the S. African War and the First Great War.

In 1933 it came on to the military establishment as the Northern Rhodesia Regiment. The ranks are recruited mainly from the Babemba, Baila, and Angoni tribes, while its European officers and senior N.C.O.s are permanently posted to the regiment. Normally, the regiment has a strength of two battalions, which was expanded to eight in the Second Great War. Battalions served in the East African campaign, Madagascar, N. Africa, Syria, and with the 14th Army in Burma. In April, 1947, the regiment dropped Northern from its title and was granted the prefix Royal, and the following August King George VI became colonel-in-chief.

Rhodes Trust. Trust established under the will of Cecil Rhodes for the purpose of granting scholarships at the university of Oxford to students from the

British dominions, the U.S.A., and formerly from Germany. Following Rhodes's testamentary instructions, the scholars are selected with regard to (1) literary and scholastic attainments, (2) achievements in manly outdoor sports, (3) moral qualities, and (4) exhibition of force of character, etc., in school days.

The yearly value of the Rhodes scholarships was originally £300, but this was several times increased, and in 1946 was fixed at £500. Under the will, 60 scholarships were endowed for the British Empire, two for each state of the U.S.A., and five to be nominated by the German emperor from Germany. The last-named were withdrawn by Act of Parliament during the First Great War, but from 1929 to 1939 Germans were again elected. The number of scholars at one time is about 200. The headquarters of the trust is at Rhodes House, Oxford.

Rhodian Ware. Class of glazed pottery, also known as Turkish ware. It was made in Rhodes, and

at Nicaea, Kutaya, and elsewhere in the Turkish Empire. The best ware, especially tiles and dishes, was produced in the 16th and early 17th centuries. The ground is generally pure white,

with bold designs in blues, greens, etc., outlined with a dark pigment.

Particularly characteristic is the decorative use in relief of a red clay pigment, known as Armenian bole. Sometimes this covers most of the white ground. Persian motives are frequent, though the Turkish treatment of flowers is broader and more naturalistic. The glaze is unusually thick.

Rhodium. One of the six metallic elements of the platinum (*q.v.*) family, discovered by W. H. Wollaston in 1803 and named after the Greek *rhodon*, a rose. Its chemical symbol is Rh, and it is one of the transitional elements in the second long period of the

periodic table, with ruthenium and palladium, its group neighbours being cobalt and iridium. It has an atomic number of 45; atomic weight, 102.91; specific gravity, 12.4; melting point, 1,966° C.; electrical conductivity, 35 (silver being 100); crystal form, face-centred cubic, with lattice constant $a = 3.795$; and an interatomic distance of 2.683 Å.U.

Rhodium always occurs closely associated with platinum, palladium, and the other metals of the group in the Urals and S. Africa, and as rhodite in certain gold ores, particularly in Mexico. The chief source is the low-grade copper nickel ores at Sudbury, Ont. It

is extracted by wet processes during the refining of platinum. The product is a metal of a purity of at least 99.7 p.c., bluish-white in colour. It may be melted on a lime hearth and cast at very high temperatures, but the product is hard and difficult to work until it has been forged at high temperatures. It can be produced as thin sheet and fine wire, down to a diameter of 0.004 in. The annealed metal has a Vickers hardness of about 100, but that of the electro-deposited metal is about 800. It resists the attack of all acids, including aqua regia, but will dissolve in fuming sulphuric acid at 300° C. It does not oxidise in air even at high temperatures.

Various platinum-rhodium alloys are used in industry, those containing 10 p.c. rhodium and 90 p.c. platinum, or 13 p.c. rhodium and 87 p.c. platinum, making one wire in thermocouples for high temperature measurements, the other wire being pure platinum. The alloy containing 20 p.c. rhodium is used for the windings of resistance furnaces. Similar alloys are used in crucibles, magneto contacts, and spinnerets for the rayon industry. If an article is highly polished and then rhodium-plated, no further polishing is ever needed. Electro-deposited rhodium is used for reflectors, all the polishing being completed before plating, the metal has high reflectivity over a wide range of the spectrum.

Rhodochrosite. Mineral manganese carbonate, usually containing small quantities of iron, calcium, and magnesium. Red in

colour, whence its name, it is found associated with manganese, silver, lead, and other metallic ores; also as a metasomatic replacement of limestone.

Rhododendron (Gr. *rhodon*, rose; *dendron*, tree). Genus of evergreen shrubs and trees of the family Ericaceae. They are

natives of the E. Indies, China, Japan, India, the mountains of Europe, and N. America, and have been introduced into Great Britain at various dates since 1656, when *R. hirsutum*, the hairy alpenrose, came from Switzerland. The tender kinds need ordinary greenhouse treatment in pots, at an average



Rhododendron. Flower cluster of this hardy shrub

temperature of 50° to 60° F. during winter and early spring, and they may be placed out of doors during summer. The more important hardy species may be planted anywhere, in good soil that is free from lime, while many kinds prefer peat.

They may be planted at any time in autumn or spring, and should be mulched after flowering in May with well-rotted manure. Flowers are of all shades and colours, except blue. The hardy purple-flowered rhododendron, *R. ponticum*, is an excellent subject for the wild garden, in miscellaneous belts of shrubs on the outer ring of cultivation, and also in newly made woods as a covert plant. Rhododendrons are propagated by seeds or by layers taken in spring or autumn. Choice seedlings are sometimes grafted upon *R. ponticum* and other robust species. There are over 200 species of rhododendron.

Rhodonite (Gr. *rhodon*, rose). In mineralogy, name given to a manganese silicate belonging to the pyroxene group of minerals. Part of the manganese has usually been replaced by iron, calcium, or zinc. The mineral has a glassy appearance, is some shade of red in colour usually, and generally occurs in certain metalliferous veins. Some varieties are cut and polished for gemstones and are also used to give a violet colour to glass and in glazes.

Rhodopé Mountains. Outlying chain of the Balkan Mountains (*q.v.*). They are mostly in S. Bulgaria, partly in Greek



Rhodian Ware. Sixteenth century Turkish jug having a blue background decorated with cream and red flower buds

By courtesy of The Victoria and Albert Museum, Kensington

Macedonia and Thrace, extending S.E. from the Sofia district towards Adrianople (Edirne) and the Aegean Sea. The loftiest peak is Muss-Alla Dag, alt. 9,613 ft. S.E. of this rises the range Dospad Dag (Despoto Dag), a name sometimes applied to the parent chain. Other peaks are Jel Tepe (8,796 ft.), Rilo Dag (8,790 ft.), Vitosha (7,515 ft.), Sitke Dag (7,177 ft.).

Rhodopis. Greek courtesan who lived at Naucratis in Egypt, whither she had been brought as a slave. Charaxus, brother of the poetess Sappho (*q.v.*), met her there and became so enamoured of her that he paid a large sum of money to have her set free. This roused the anger of Sappho, who attacked Rhodopis in one of her poems. The Cinderella story that Psammetichus III, king of Egypt, found her shoe and was so struck by its daintiness that he immediately made her his wife, is chronologically impossible.

Rhombus. A figure with four sides all of equal length, but having acute or obtuse angles between them, whereas a square has four right angles. The school-boy's definition, "a squashed square," is expressive. A rhomboid bears the same relation to a rhombus as a rectangle does to a square; i.e. it is a parallelogram but its adjacent sides are not equal in length, and of course it contains no right angle.

Rhonchi (Lat. *rhonchus*, snorting). Sounds heard either through the stethoscope or by placing the ear to the chest, in persons suffering from bronchitis. They are due to obstruction of the air passages, by swelling of the mucous membrane, or the presence of secretion.

Rhondda. River of Glamorganshire, Wales. It is formed by the confluence of the Rhondda-fach and Rhondda-fawr, and flows 15 m. S.E. to the right bank of the Taff at Pontypridd. It passes through the Rhondda valley, one of the chief mining districts of Wales.

Rhondda. Urban district of Glamorganshire, Wales. It stands in two valleys of the above river Rhondda, about 10 m. N.W. of Pontypridd, and is served by rly. The chief buildings are parish churches and other places for worship, the offices of the district council, and several public halls. Despite the depression of the early 1930s, coal mining remains the chief industry; but there are 28 new factories turning out garments, light engineering, and electrical appliances. Coal

began to be worked about 1870, and in 1877 an urban district was formed, its name being changed from Ystrad-y-fodwg, that of the original parish, to Rhondda in 1897. It includes Tylorstown, Pentre, Cymmer, Ferndale, Treherbert, Dinas, Porth, Treorchy, Llwynypia, and Tonyypandy. In 1885 it became a division sending one member to parliament; from 1918 it has elected two. Pop. 111,500

Rhondda, DAVID ALFRED THOMAS, VISCOUNT (1856-1918). British merchant and politician.



Viscount Rhondda,
British politician
Elliott & Fry

Born at Aberdare, March 26, 1856, he was the son of a successful grocer who later became interested in collieries. The son was educated at Clifton, and Caius College, Cambridge, after which he entered business in S. Wales. He soon became one of the leading men in the coal and allied trades, the

In 1888 Thomas entered parliament as Liberal M.P. for Merthyr, and therein he sat continuously until 1910, the last few months for Cardiff, but did not make a successful politician, and retired a disappointed man. Coming home from the U.S.A., where he had been in connexion with the supply of munitions, he survived the torpedoing of the Lusitania. In 1916 he was made a baron, and joined the coalition ministry as president of the local government board. The following

year he became food controller, and successfully started rationing, but the work broke him physically and on July 3, 1918, he died, having just been made a viscount; this title passed to his daughter (*v.i.*).

Rhondda, MARGARET HAIG, 2ND VISCOUNTESS (b. 1883). British editor. Born June 12, 1883,

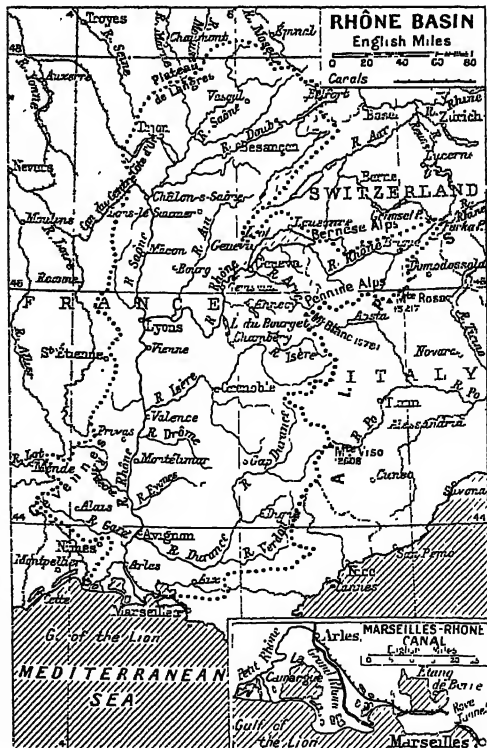
she went to St. Andrews, and became known as an advocate of woman's rights. She was married, 1908-23 to Sir Humphrey Mackworth,

Bt. In 1915 she was a survivor of the Lusitania disaster. By special remainder she succeeded to her father's peerage in 1918. Founder editor of Time and Tide, she wrote a life of her father, 1921; and This Was My World, an autobiography, 1933.

Rhône. River of Switzerland and France. It rises in the Rhône glacier, between the Furka and



Viscountess Rhondda,
British editor



Rhône. Map of the area drained by the river and its tributaries. Inset, Marseilles-Rhône canal

Grimsel Passes, in the Bernese and Pennine Alps, and flows, a rushing mountain stream, into the Lake of Geneva. Passing through the lake, it emerges at Geneva, flows S.W. and S. to a point 18 m. W. of Chambéry, where it turns N.W. and W. to Lyons. Joined there by the Saône, it flows practically due S. to Arles, where it breaks into two main branches, the Petit Rhône and the Grand Rhône, and several lesser streams, which enclose the delta known as La Camargue, with an area of about 300 sq. m., and so reaches the Mediterranean.

The chief tributaries of the Rhône are the Ain, Saône, Isère, Drôme, Ardèche, Eygues, Durance, and Gard. Its valley is naturally of great economic importance, and among the towns on its banks are Brigue, Geneva, Lyons, Vienne, Valence, Avignon, and Arles. From the sea to Lyons navigation, though difficult in parts, is active; above Lyons the traffic is smaller. The Rhône is connected by canal with the Rhine, Loire, Yonne, Seine, and with Marseilles.

In 1938 work started on the Genissiat (*q.v.*) dam on the Upper Rhône. This project, interrupted by the Second Great War, was completed in Jan., 1948. The dam is 320 ft. high and impounds the waters of the Rhône for a distance of 14 m. The reservoir feeds a turbo-electric plant which, with its five 975-ton turbines, is one of the most powerful in Europe. When it was completed, only that at the mouth of the Dnieper, Russia, was more powerful. The Genissiat plant was the first of 21 projected along the Rhône valley, to have a total annual generating capacity equivalent to one-third of electricity production in France from all sources. The

dams were planned not only to provide power for the electrification of the P.L.M. rly. and for the Paris and Lyons dists., but also to reduce the rate of flow of the Rhône and so improve navigation of the river. See Geneva; Rhine.

Rhône. Dept. of France. It lies contiguous with the depts. of Saône-et-Loire, Loire, Isère, and Ain, and is the smallest dept. in area save those of Belfort and Seine. It is hilly and has many picturesque tracks, notably in the Monts du Beaujolais, de Tarare, and du Lyonnais. The stony soil is generally unfertile, except in the Rhône and Saône valleys, but the vine is successful in the Beaujolais and the S. parts, and the mulberry, used for silkworms, is important. The dept. is chiefly industrial, the great silk industry centring in Lyons, and there are engineering and iron works, muslin, chemical, and glass factories, stone quarries, iron, copper, and coal mines. The rivers include the Rhône, Saône, Azergues, Vauxonne, Ardière, Yzeron, and Garon. The towns include Lyons (the capital), Villefranche, Vaugneray, Tarare, Beaujeu, St. Laurent, Amplepuis, Thizy, and Givors. Area of dept. 1,104 sq. m. Pop. 918,866, of whom 460,748 are in the city of Lyons.

Rhubarb (from Gr. *rhēon barbaron*, barbarian *rhēum*). Edible-stalked herbaceous plant of the family Polygonaceae, genus *Rhēum*,

a native of Siberia. The stalks are stewed and eaten as a sweet, but the roots possess valuable medicinal properties. Preparations of rhubarb are valuable for disorders of the stomach and of digestion in children. Rhubarb will flourish in any soil that is not waterlogged. Well rotted stable manure should be dug deeply into the ground

before planting, and basic slag and phosphate of lime must be applied if the ground is deficient in these. Autumn planting may be resorted to, but it is better to plant in the spring, and pull no stalks of the rhubarb during the first season. Too many stems should not be taken from any particular plant during any one season, as this weakens the root.

Rhubarb can be forced in the open air by covering the young

plants with drain pipes, or similar articles, and packing the exteriors or bases of these receptacles with fermenting manure. Roots of three-year-old plants may be forced by placing them in a dark position under the staging of a greenhouse, or in a house devoted to the culture of mushrooms. Propagation is usually and simply carried out by dividing the roots with a sharp knife into as many pieces as will allot a crown to each fragment.

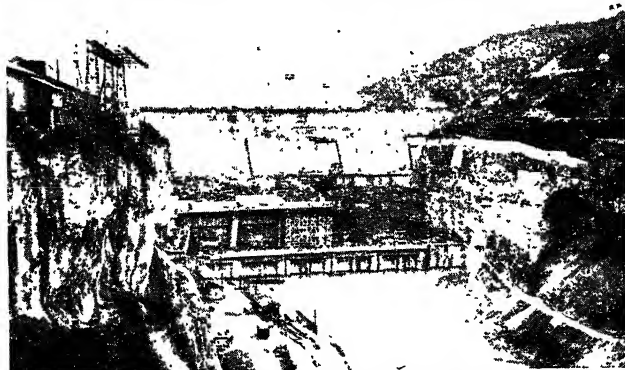
Rhubarb may also be raised from seed sown in autumn in the open air, though this is not usual. There are several varieties, one of the most noteworthy of which is champagne rhubarb, used in some localities in England and France to make an effervescing beverage. This is said to form the basis of many brands of cheap champagne. *R. officinale*, and some other species, are grown in the margins of shrubberies, in deep rich soil, as ornamental plants, for the sake of their bold leaves.

Rhubarb leaves are poisonous to animals and humans. The stalks are used in jam, and sometimes in the form of pulp for addition to fruit used in jam making.

Rhuddlan or **RHYDDLAN**. TOW. of Flintshire, Wales. It stands on the Clwyd, 8 m. N. of Denbigh, 3 m. S. of Rhyl, and has a station on a branch rly. It is famous for



Rhubarb. Leaves and flowers of the common edible species



Rhône. General view of the Genissiat dam, gradually filling up. One of the largest dams in Europe, it forms part of a huge hydro-electric system designed to produce one-third of all electric power in France



Rhuddlan, Flintshire. Ruins of the castle seen from across the river Clwyd

its castle, now in ruins and ranked as an ancient monument. This was built in the 11th century, and in it Edward I held a parliament in 1283. S. Mary's church is an old building. A bridge dating from the 16th century leads across the river to Rhuddlan Marsh, where, it is said, Offa of Mercia defeated the Welsh Caradoc in 795. Rhuddlan was once a flourishing seaport; encroachment of sand, however, destroyed its prosperity, and the borough privileges given by Edward I fell into disuse. Pop. 1,519. *Pron.* Rithlan.

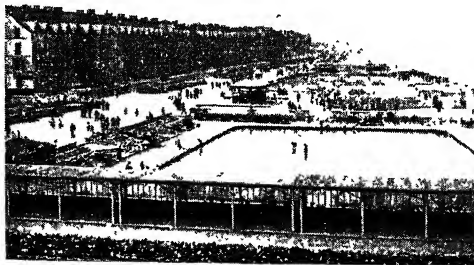
Rhumb Line. Any line on the surface of a sphere which cuts successive meridians at a constant angle; and hence the path of a ship which sails continuously towards the same point of the compass. On the surface of the globe, rhumb lines are double spirals asymptotic to the poles; they are not the shortest distance between points, but, except for long voyages or at high latitudes, they are regularly used in navigation on account of the ease in steering. They can be simply plotted on Mercator's projection, where they are represented by straight lines.

Rhyl. Urban district and seaside resort of Flintshire, Wales. It stands at the mouth of the Clwyd, 30 m. by rly. N.W. of Chester. It was a small fishing village, but towards the end of the 19th century became well-known as a holiday centre. It has good sands, a theatre, a marine lake, and provision for all kinds of sports and amusements, including roller-skating. Pop. est. 19,000.

Rhyme or RIME (Anglo-Saxon, *rim*, probably from Gr. *rhythmos*, rhythm). In poetry, the repetition, at the end of one or more lines, of the sound or combination of sounds at the end of another line. In English rhymed verse, the last stressed vowel and all the following sounds of each rhyming line are identical, the preceding consonants being different, whereas in French verse the latter may be identical (rich

rhyme), provided that the words are not the same. In masculine rhymes the final syllable alone rhymes; feminine rhymes consist of a stressed followed by an unstressed syllable. Triple rhyme, with two unstressed syllables, is used in English poetry mainly for comic or grotesque effect. Internal rhyme, *viz.* within the limits of a single line, is common in ballads. Inexact rhymes are used by many modern poets.

As a natural means of marking and enriching rhythm, rhyme arose independently among various races. Outside Europe, it is used by the Chinese, Hindus, Arabs, and others. Intimately associated with accentual metre, it was avoided in Greek and Latin poetry, which followed the rules of quantitative metre, and reappeared in Latin verse in the 4th century A.D., when the native instinct for accent reasserted itself. Medieval Latin hymns were probably the chief source of rhyme in the W. European literatures. In English and other Teutonic languages it slowly replaced alliteration from the 9th century to the 15th. With the revival of classical learning a prejudice arose against rhyme, and many experiments were made with unrhymed metres. *See* Blank Verse; Couplet; Poetry; Prosody; Quatrain; Vers Libre.



Rhyl, Flintshire. Sea front and paddling pool

Rhymer's Glen. Glen near Melrose, Roxburghshire, Scotland. Huntly Burn flows through it, and its name is due to the story that here Thomas the Rhymer met the queen of the fays.

Rhyming Slang. Method of indicating words by a rhyming or quasi-rhyming substitute. It was

originally used in the early 19th century by London thieves and pickpockets so that they could communicate their plans within earshot of an intended victim without revealing their intentions. Examples are: tit for tat, hat; San Toy, boy; Joe Rook, book; pig's ear, beer; skyrocket, pocket; Oxford scholar, dollar. Unlike nearly all other systems of cant, rhyming slang was not founded on allegory, except in a few examples, *e.g.* sorrowful tale, three months in jail; I'm afloat, a boat; and artful dodger, lodger. In time rhyming slang became translatable to the uninitiated, and the practice arose of further concealing its meaning by suppressing the rhyming word, *e.g.* flounder and dab (cab) became flounder; I'm so frisky (whisky) became I'm so; tit for tat became titfor. Towards the close of the 19th century the *Sporting Times* printed long lists of rhyming slang words which passed into general use, especially in London.

Rhymney or RUMNEY. River of England and Wales. Forming the boundary between Monmouthshire and Glamorganshire, it flows 30 m. S. to the Bristol Channel, which it enters 2 m. E. of Cardiff.

Rhymney. Urban dist. of Monmouthshire, England. It stands on the Rhymney, 2 m. from Tredegar, and is served by rly. All around are coal mines, and the place has important iron and steel works and a clothing factory. Pop. 18,872.

Rhynie Chert. In geology, a deposit of silicified peat of Old Red Sandstone age which contains many well preserved plant remains of that period. It occurs near Rhynie, Aberdeenshire, Scotland.

Rhyolite (Gr. *rhein*, to flow; *lithos*, stone). In geology, name given to an acid silica-rich lava showing pronounced flow banding. Those in which soda is present as a large

percentage are called soda rhyolites. If quartz crystals are large enough to be seen with the naked eye, the rock is termed porphyritic rhyolite. Rhyolite grades to glassy obsidian (*q.v.*) or to scoriaceous pumice, and is found in many volcanic regions. The name was suggested by Richtenhofen from the characteristic flow-

structure of the rock. See Igneous Rock; Liparite.

Rhys, ERNEST (1859-1946). British writer and editor. He was born in London, July 17, 1859,



Ernest Rhys,
British writer

but spent his early adult years in the mining industry in Wales and N. England. In 1885 he finally settled in London and took up literature as a career, being, with Yeats, Dowson, and Lionel Johnson, among the original members of the rhymers' club. The following year he produced the first volume of the Camelot classics. His great achievement as an editor, however, was Everyman's Library (*q.v.*) which he started in 1906. As a writer Rhys produced verse, collected in *Rhymes for Everyman*, 1933; and *Song of the Sun*, 1937, as well as volumes of reminiscence, *Everyman Remembers*, 1931; and *Wales England Wed* (1940). But his status as editor was far greater than as author. He died in London May 25, 1946.

Rhys, SIR JOHN (1840-1915). Welsh philologist. Born June 21, 1840, in Cardiganshire, and educated at Jesus College, Oxford, the Sorbonne and in Germany, he became an inspector of schools in Wales. In 1877 he was appointed professor of Celtic at Oxford, and in 1895 principal of his old college, a post he retained until his death. He was an authority on Celtic inscriptions and all matters connected with Wales. His most important writings were *Lectures on Welsh Philology*, 1877; *Celtic Britain*, 1882; *The Welsh People*, 1900; *Celtic Inscriptions of Gaul*, 1911-13. He died Dec. 18, 1915.

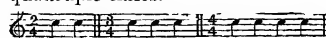
Rhythm (Gr. *rhythmos*, measured motion, symmetry). Periodicity of processes, motions, or sounds. Rhythm is a fundamental fact of life, consisting in the alternation of the antithetical processes of waste and repair, of discharge and restitution, of activity and recuperation. All life is thus rhythmic in character, each life-cycle being a repetition of a preceding one, and during the progress of the grand period of each individual various periodic movements occur in growing and adult organs. Further, all metabolism consists of rhythmically recurrent processes of anabolism and catabolism. In addition to this regularly repeated rhythm external

factors may induce a secondary rhythm, and the phenomena observed in nature are the result of the cooperation of these two.

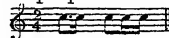
In its more general connotation rhythm is one of the three essential elements of music, the others being harmony and melody, and it is the distinguishing characteristic of dancing. As a result of the intimate association of poetry with music, all verse having originally been composed for intoning to the harp or singing to the pipe or lyre, rhythm draws the capital distinction between poetry and prose, which is the vehicle of thought intended to be spoken. Verse of the traditional kind, whether rhymed or unrhymed, is written in metre and strict rhythm, on its technical side thus becoming a subject for the grammarian, of whose science the laws of versification form part under the name of prosody.

Prose, on the contrary, is written without constraint of metre, and in rhythm so various as to have defied all attempts to reduce it to rule. Nevertheless, rhythm is an integral part of good prose, at once the effect and the cause of emotion in polished oratory, and providing for the finest thought a diction perfectly apt, because possessing a musical cadence in harmony with the truth expressed. Freedom from law is the distinguishing characteristic of prose rhythm, and it falls short of perfection by precisely so much as it is the product of mechanical devices such as antithesis, parallelism, and the rest. Elaborate treatments of the subject may be found in such works as Thomson's *Basis of English Rhythm*, and Saintsbury's *History of English Prose Rhythm*. Perhaps the most fruitful influence in the development of prose rhythm is the Authorized Version of the Bible. See Music; Poetry; Prose.

Rhythm. In music, term used in varying but inter-related ways. Being measured, it implies subdivision, proportion, and periodicity as applied to notes, beats, bars, and phrases. (1) As in verse, so also in music, the alternation of strong and weak units (beats) is an essential characteristic. The number of weaker beats intervening between the occurrence of the stronger ones differentiates one tune from another. Thus in the following example are shown in simple beats duple, triple, and quadruple times.



Here are accent and periodicity, but no rhythm. But where music differs from verse is in the much greater freedom with which its beats can be sub-divided. Thus the following is, as regards time, fundamentally the same as the first of the above examples, but the form of each beat is varied rhythmically, thus displaying the quality of proportion:



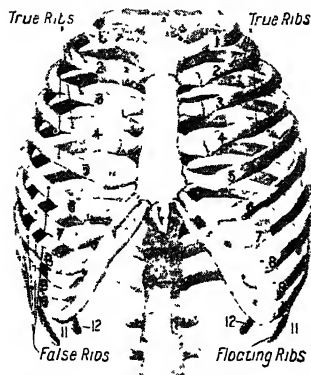
(2) Just as a bar consists of a grouping of beats with respect to accent, so a musical phrase is a grouping of the bars, which in themselves are also divided like beats into accented and unaccented. The termination of a phrase being marked by the occurrence of a cadence. According to the number of such bars, the phrase is said to be in two or four bar rhythm, as the case may be. Though phrases of other lengths are often to be found, the two or four bar rhythm is so predominant that it is often regarded as fundamental. In reality, however, it is no more natural than other rhythms, its greater frequency being due to its simplicity and consequent ease of apprehension.

Ria (Span., mouth of a river). Long, narrow inlet in the Galician coast of Spain. The name is used for the inlets formed by the submergence of a region of mountain ridges separated by valleys. The sunken ridges become rocky promontories separating tapering rias, which, unlike fjords, shallow continuously the farther they penetrate into the land. Bantry Bay, Kenmare River, and Dingle Bay in Eire, and Falmouth Bay and Plymouth Sound in S.W. England, are examples of rias.

Riau-Lingga. Archipelago of Indonesia (*q.v.*). Before the Second Great War it formed a Dutch residency. It embraces the Riau (Riouw), Lingga, Tambelan, Natuna, and other groups of islands. The chief island of the Riau group is Bintang or Riouw, adjacent to which on an islet is Rio (Riouw), the chief town of the residency. Trepang, tin, and pepper are exported. During the Second Great War it was in Japanese occupation from 1942-45. Area, 12,235 sq. m.

Rib. In the human being, one of a series of paired, curved bones. Ribs are twelve in number on either side of the body, and in either sex. Posteriorly, the ribs articulate with the spinal column. Their anterior ends terminate in cartilaginous prolonga-

tions, the costal cartilages. The first seven pairs of ribs articulate with the sternum or breast-bone.



Rib. Diagram indicating relative positions of true and false ribs

The cartilages of the next three are attached to the cartilage of the rib above each. The extremities of the last two ribs are entirely free, and for this reason they are sometimes termed "floating ribs." At the posterior end is a thickened part known as the head. Along the lower margin of each rib runs a groove which contains a nerve and blood-vessels.

Fracture of a rib may be produced by direct violence such as a blow, and in that event the bone breaks inwards, and serious injuries to the pleura, lungs, or liver may result. Indirect violence tends to cause fracture at the point of maximum curvature, the fractured ends being directed outwards. Indirect fractures are treated by strapping the affected side of the body with strips of adhesive plaster, to limit as far as possible movements of the bone. Strapping of a direct fracture is undesirable, as it tends to drive the broken ends farther inwards.

A cervical rib is an additional rib, usually present on each side, and arising most frequently from the 7th cervical vertebra. It may be free or may unite with the first rib. In early life this deformity may produce no symptoms, but as the bone grows it is likely to interfere with the arteries and nerves in the neighbourhood, producing neuralgia, paralysis, and possibly gangrene of the fingers from interference with the circulation. When these symptoms persist the possibility of there being an extra rib must be investigated by X-rays. If present, it should be removed by an operation. See Anatomy; Man.

Ribalta, FRANCISCO (c. 1551-1628). Spanish painter. Born at

Castellon de la Plana, he studied in Valencia and in Italy. His best works are to be found in the churches and museums of Valencia; one may cite especially his great altar-piece, *The Last Supper*, in the college of Corpus Christi. His *Christ Borne by Two Angels* is in the Prado, Madrid.

Ribar, IVAN (b. 1884). Yugoslav politician. Of Croatian birth, he became a lawyer, and member of the national assembly formed at the end of the First Great War. He was leader of the anti-fascist council of liberation under Marshal Tito during the Second Great War, and became first president of the Communist-controlled assembly, Dec. 2, 1945.

Ribbentrop, JOACHIM VON (1893-1946). German diplomatist. Born at Wesel, April 30, 1893, of a military family, he was educated at Metz and at 18 went to Canada, where he worked as a draughtsman in Quebec. He returned to Germany on the outbreak of the First Great War and served on the eastern front; later he went by submarine to the U.S.A., where he assisted Papen (*q.v.*) in sabotage activities. After Papen's recall, Ribbentrop accompanied him to Turkey. He travelled for a French wine firm, married Anna Henkel (daughter of a German millionaire), and became a partner in Henkel's, and in 1929 met Hitler. Under the Nazi regime he rose rapidly in office.

Ambassador to London from 1936, Ribbentrop was promoted to the foreign ministry in 1938, and as a member of Hitler's secret cabinet played a leading part in the Führer's preparations for aggressive war. His name became synonymous with double-dealing. He was chiefly responsible for annexing Austria and dismembering Czecho-Slovakia; negotiated the Russo-German pact; and delivered the ultimatum to Poland which preceded the Second Great War. Then he carried through the three-power pact with Italy and Japan. During the final phase of the war he was superseded by Doenitz. He was captured by British troops at Hamburg, June 14, 1945. Indicted as a war criminal at the Nuremberg trials (*q.v.*), he was executed Oct. 16, 1946.

Ribble. River of England. It rises on the E. of Wharfedale and

flows S. and S.W. through the W. Riding of Yorkshire, forming the boundary of that county with Lancashire for about 6 m. It then resumes a S.W. course through Lancashire to the Irish Sea, which it enters by an estuary of maximum breadth of 6 m. Preston is on its right bank, near the head of the estuary. Its length is 75 m.

Ribblesdale, THOMAS, 4TH BARON (1854-1925). British peer. He was born Oct. 29, 1854, and became a prominent figure in society, succeeding to the peerage in 1876. He was lord-in-waiting to Queen Victoria, 1880-85, and during 1892-95 master of the buckhounds. His portrait by Sargent, in hunting dress, is in the National Gallery. When he died, Oct. 21, 1925, the title became extinct.

Ribbon. Word used in a military sense for the specially coloured ribbons from which medals are suspended. To avoid the inconvenience of wearing a medal constantly, a piece of its proper ribbon, $\frac{3}{8}$ in. deep, is worn on the left breast, and where more than one ribbon is used, they are placed side by side, descending in order of precedence from the right of the wearer. See Medals colour plate.

Ribbon and Ribbon Making.

(Fr. *ruban*, from O.F. *riban*, *ruband*, still preserved in the English form *riband*). A woven fabric of width usually nine ins. or less, with a selvedge at each side, i.e. not cut from wider fabric; usually of silk or rayon, in either a satin or a ribbed weave, and intended for the millinery and haberdashery trades, trimmings, and ceremonial insignia. Also, in engineering, a narrow strip of metal or other material. The silk ribbon industry was brought to England by Protestant refugees from Lyons and St. Etienne about the beginning of the 18th century, and was centred round Coventry. By the end of the 19th century more than 25,000 people were employed in it there, many on hand-loom in their own houses, or in small factories having only half a dozen or so looms. By the 20th century, most of the industry was concentrated in a few large specialist firms in the Coventry and Derby areas, power-driven "smallware" looms replacing the hand looms except for certain elaborate ceremonial ribbons. The ware looms are usually multiple machines with some of the moving parts common to all, and with all moving parts working in unison. Precision-built high-speed single



J. von Ribbentrop, German diplomatist

units are also used. In addition to single-colour ribbons, striped effects in different colours, and fancy patterned effects can be woven, and gold and silver tinsel threads can be introduced. *See Loom; Silk; Weaving.*

Ribbon Development. Term applied in Great Britain to the building of factories or long lines of houses beside arterial roads leading from cities. The practice grew immediately after the First Great War, when new roads were

compressed so as to resemble a ribbon. The back fin runs the whole length of the body, and in some species it is developed above the head into a series of long rays. In one form, the ventral fins consist of single rays tipped with a red tag, which is said to be used as a bait to attract the small fishes on which the animal feeds. Some ribbon fish attain a length of 20 ft., with a depth of a foot and a thickness of little more than an inch. *See Oar Fish.*

Ribbon Grass (*Phalaris arundinacea*). Stout, tall grass of the family Gramineae. A native of the N. temperate regions, the cultivated variety *variegata* has broad, flat leaves striped with yellow. It has a creeping rootstock, and stout, erect stems 6 ft. high, ending in a loose plume of flowers tinged with purple. The wild form grows on British river-banks and the margins of lakes, and is known as reed-grass.

Ribbonmen. Term used for the members of the Ribbon Society. This was an Irish secret society founded about 1820, and so called from the green ribbon worn by members in their buttonholes. It was composed of small farmers, agricultural labourers, small shopkeepers, and artisans of the R.C. faith, and its purpose and policy varied according to district. In Ulster it was primarily a league against the Orangemen; in other provinces it was an organization against rack renting and other agrarian grievances, while in the town it approximated to trade unionism. After being proscribed as an illegal body by an Act of 1871, the society died out.

Ribchester. Village of Lancashire, England. It stands on the Ribble, 5 m. N.W. of Blackburn. It is notable as the site of a Roman station, Bremetennacum, which was garrisoned for 300 years by auxiliary troops. They included Polish Sarmatians, this being attested by an altar inscription and a gold-studded leather-covered ox-skull, now lost. A bronze helmet and sepulchral slab portray cavalry.

Ribeauville (Ger. *Rappoltsweiler*). Town of France, in the Haut-Rhin dept. It is picturesquely placed at the foot of the Vosges mts. 33 m. S.S.W. of Strasbourg. It produces excellent red and white wines, and its industries include textile manufacture, printing, and dyeing. There are a calcium-sulphate mineral spring recommended for

gravel and similar disorders, and a carbon dioxide spring bottled for use as table water. The town is connected with the main rly. line by a normal gauge rly., 2½ m. long, laid on the high road. To the W. are ruins of three castles. Above the town a barrier of unhewn stones, 8–10 ft. high, encircles the crest of the Vosges.

Ribera, JUSEPE OR JOSÉ DE (1588–1656). Spanish painter, called Lo Spagnoletto. Born at San Felipe, Jan. 12, 1588, he studied under Francisco Ribalta at Valencia, and Caravaggio at Rome. Becoming prominent among the Naturalistic painters, he worked successfully at Rome, Parma, and Naples. His Shepherd with a Lamb is in the National Gallery, London. *See Jerome, S.*

Ribeisaceae OR CURRANT FAMILY. Family of shrubs. Natives of Europe, temperate Asia, and N. America, they have alternate, lobed leaves. To the bell-shaped calyx, the minute flower petals are attached. The fruit is a pulpy berry containing numerous seeds. A few, like the American species *Ribes sanguineum* and *R. speciosum*, are grown for their showy flowers; others for fruit. *See Currant; Gooseberry.*

Riboflavin. Name for vitamin B₂, also called ovoflavin, hepatoflavin, vitamin G, dimethyl-ribityliso-alloxazine, and lactoflavin. An orange-yellow crystalline powder, slightly soluble in water, with formation of a yellow-green fluorescent solution, it is destroyed by alkalis and slowly by light, but is stable in heat. Sources are eggs, liver, kidney, meat, milk, cheese, wheat germ, and yeast. *See Vitamins.*

Ribot, ALEXANDRE FÉLIX JOSEPH (1842–1923). French statesman. He was born at St. Omer, Feb. 7, 1842, and educated in Paris, graduating in law at the Sorbonne. An advocate, he was elected to the chamber of deputies in 1878. He was foreign minister 1890–92, and paved the way for a Russian alliance. His early premier-ships were in 1892–93 and 1895; he came to office again for two days in June, 1914. He was minister of finance in 1915; prime minister for the fourth time, March–Sept. 1917; thereafter minister for foreign affairs till the fall of the



Ribbon Grass. A cultivated form of the grass *Phalaris arundinacea*

constructed and the land on either side of the road was acquired by builders who erected houses for quick sale and with little consideration for the safety or convenience of purchasers or the natural amenities of the countryside. Similar building took place beside existing main roads and this resulted in tentacle expansion of towns through which the roads passed. The practice artificially inflated roadside land values, and proved wasteful of land, as there was little building in depth.

Hundreds of miles of roads and their verging land were disfigured by ribbon development, and thousands of people were encouraged to live in conditions and surroundings which did not foster a spirit of civic responsibility. Ribbon development caused serious hindrance and danger to through traffic by badly designed points of access and the presence of stationary vehicles at the roadside, and in 1935 parliament passed an Act restricting the permitted distance of buildings from the centre of the road. Along all roads which on May 17, 1935, were classified roads, it became illegal to construct, without consent of the highway authority, any access to the road or to erect any building within 220 ft. of the middle of the road. *See Town Planning.*

Ribbon Fish (*Trachypteridae*). Popular name given to various deep-sea fishes which have the body elongated and laterally



Josepe de Ribera, Spanish painter

cabinet of Painlevé in Nov. Ribot, who was a member of the French Academy, wrote a *Life of Lord Erskine*, 1866. He died Jan. 13, 1923, and his letters to a friend appeared in Eng. trans., 1925.

Ribot, Théodule Armand (1839-1916). French psychologist. Born Dec. 13, 1839, at Guingamp, he became a teacher for some years. In 1876 he founded *The Philosophical Review*, and in 1885 began to lecture on psychology. In 1888 he was made professor at the Collège de France. Ribot defines psychology as the science of facts which appear under two inseparable aspects—the internal or conscious, and the physiological. Introspection, the examination of our own thoughts and feelings, being individual and limited, needs to be supplemented by external observation. Works translated into English include *English Psychology*, 1873; *Heredity*, 1875; *Diseases of the Will*, 1884; *Essay on the Creative Imagination*, 1906. Ribot died Dec. 9, 1916.

Ribston Hall.

Mansion in the W. Riding of Yorkshire, England. It is on the Nidd, 3½ m. S.E. of Knaresborough. Early in the 13th century it belonged to the Knights Templars, who held it until 1311, when the property passed to the possession of the crown. In 1324 it was handed over to the Knights Hospitallers of S. John of Jerusalem, who held it until the Reformation. Later it came into the hands of the Goodricke family to be rebuilt in 1674. In its gardens, in 1709, the first Ribston pippin was planted by Sir Henry Goodricke, who introduced it from Normandy.

Ricardo, David (1772-1823). British political economist. Born in London of Jewish family, April



David Ricardo, British political economist
After T. Phillips

19, 1772, he made a large fortune on the stock exchange. In 1809 appeared his letters to *The Morning Chronicle* on depreciation of currency, and a tract,

The High Price of Bullion, urged the resumption of cash payments. In 1817 came his chief work, *Principles of Political Economy and Taxation*. This is chiefly noted for an exposition of the theory of economic rent; Ricardo stating that rent does not affect prices, but is the surplus accruing to the owner of land with advantages over that on the margin of cultivation. Mainly a follower of Adam Smith and Malthus, Ricardo laid down the theory of comparative costs in foreign trade. Retired from business after 1814, he represented Portarlington in parliament from 1819 and was an active spokesman of the Radical wing. He died at Gatcombe Park, Glos, Sept. 11, 1823. See *Rent*; consult *Works*, ed. J. R. McCulloch, 1888; *Life*; J. H. Hollander, 1910.

Ricasoli, Bettino, Baron (1809-80). Italian statesman. Born at Broglio, Tuscany, March



Ribston Hall. Garden front of this Yorkshire mansion
By courtesy of Country Life, Ltd

19, 1809, he came into a family property and soon demonstrated sympathies with the movement to unify Italy. His paper, *La Patria*, was founded in 1847, and in the disturbances of the next year he was *gonfaloniere* of Florence. He was instrumental in bringing about the union of Tuscany, and Piedmont, 1860.



Baron Ricasoli,
Italian statesman

On the death of Cavour, 1861, Ricasoli became prime minister of Italy, and by his friendly attitude towards Mazzini and his attempt to open relations with Pius IX, did much for Italian progress. Resigning in 1862, he entered office again four years later and renewed his attempts to placate the Vatican. The nation, not being with him, he was obliged to resign after a few months. He died Oct. 23, 1880.

Ricci, Matteo (1552-1610). Jesuit missionary. Born at Macerata Oct. 6, 1552, he studied law

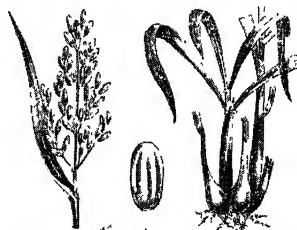


Matteo Ricci,
Jesuit missionary

in Rome, but entered the Society of Jesus in 1571. He went to India, 1577, completing his studies at Goa, and, after some discouraging attempts, succeeded in obtaining a footing for missionary enterprise in China, 1583. Having worked at Chowkingfu, 1583-89, and six years at Chaochow, after many difficulties he penetrated to Peking (Peiping), and in 1600 obtained permission to establish himself in the capital. He published a valuable book of memoirs and information on Chinese history. Ricci died at Peking, May 10, 1610.

Rice (*Oryza sativa*). Grass of the family Gramineae, native of Asia and Australia. It is very variable under different conditions, being extensively cultivated in all countries where there are marshy lands and a temperature between 60° and 80° F., which is requisite for the ripening of the grain. Fifty or more varieties are known, of which about twenty have been described as species. The flowers are produced in a pyramidal panicle. Each fruit or grain of rice stands on a separate stalk.

In average Burma rice the unhusked berry is composed of carbohydrates, 77 p.c.; proteins, 8 p.c.; fats 1 p.c.; ash, 1 p.c.; moisture, 11½ p.c. The protein element is almost wholly deficient in gliadin, the form of gluten whose stickiness enables wheat-flour to be converted by fermentation into dough. Hence rice-flour cannot be used for bread-making. Rice food takes the form of boiled or baked unleavened grain, whole, broken, or ground. In temperate climates, including China, fatty and nitrogenous elements are habitually added.



Rice. The plant and berry of this valuable grain-yielding grass

The commercial preparation of rice demands complex mechanical processes. Threshed grain or paddy, after sifting and winnowing, yields clean paddy, which by hulling is separated into husked or cargo rice and husk. Husked rice is separated by skinning into white rice and meal or bran. Polishing white rice produces the form preferred by Europeans. It may also be coated or glazed. The final yield is: polished, 44 p.c.; broken, 24 p.c.; dust, 3 p.c.; meal and polish, 9 p.c.; husk, 20 p.c.

Besides furnishing to the dietary of mankind a larger contribution than any other foodstuff, rice is used in the manufacture of starch, vinegar, and other commodities. In Japan it yields an alcoholic drink called saké. It is used in Great Britain by distillers, and in the East common arrack is made from it. The bulk of the rice crop is consumed in the countries where it is produced. Bran and polish are sold for cattle-food as rice meal. In Burma the husk, forming one-fifth of the weight of the paddy crop, is used as fuel in specially designed furnaces, or is converted into producer gas.

Rice is the chief food of the millions of China and of many others in the sub-continent of India. Failure of the rice crop is the principal cause of the periodical famine which afflicts China and Japan. The Indian famine of 1943 occurred because the Bengal harvest was short by some 15 p.c., and no rice could be drawn from Burma, which normally had a surplus for export to India, since it was occupied by the Japanese.

Rice is unsuited, except in small quantities, to those who live in colder climates as it is deficient in fatty matter and nitrogenous elements. Moreover, as it contains only a small quantity of gluten, it is useless for making into bread as it will not ferment properly. Good Indian rice contains 78.1 p.c. of starch, but only 7.4 p.c. of nitrogenous matter against 22 p.c. in wheat. See Plants colour plate.

RICE, ALICE (CALDWELL) HEGAN (1870-1942). American writer. Her maiden name was Hegan and she was born at Shelbyville, Ky., U.S.A. She made her reputation with Mrs. Wiggs of the Cabbage Patch in 1901 (a dramatisation of which proved successful in 1907). The original of the optimistic Mrs. Wiggs, "the apostle of sunshine," was reputed to have been a certain Mrs. Bass, of Louisville, who suffered annoyance from visitors on that account, and in 1904 had



Alice Hegan Rice,
American novelist

to answer a charge of throwing a pitcher at one of them. Alice Hegan married the poet and dramatist, Cale Young Rice, who collaborated with her in short stories of which the volume, *Passionate Follies*, was well received. She died at Louisville in Feb., 1942.

RICE, EDMUND IGNATIUS (1762-1844). Irish philanthropist. Born June 1, 1762, near Callan, co. Kilkenny, he was for several years in business at Waterford. About 1796 he began to take an active interest in the poor of the town, and in 1802 opened a free day school for poor children. Other schools followed, and, with a few friends, he founded the religious order of the Christian Brothers (*q.v.*). The movement spread to England and Australia before Rice's death at Waterford, Aug. 29, 1844.

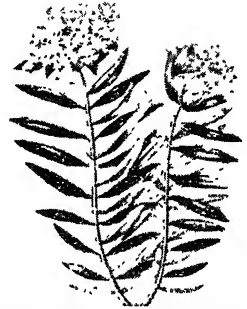
RICE, ELMER (b. 1892). American dramatist. Born in New York, Sept. 28, 1892, he was educated there, and became a solicitor's clerk. His first play, *On Trial*, was produced in 1914. During the 1920s he became a leading exponent of the expressionist school of drama, *e.g.* *The Adding Machine*, 1923, also making use of his legal knowledge. *Street Scene*, 1929, was awarded the Pulitzer prize. *The powerful Judgement Day*, 1934, was the best known in England of Rice's plays. In 1945 came *Dream Girl*. Rice staged his own work, and also produced Robert Sherwood's *Abe Lincoln in Illinois*. In 1945 he was elected president of the Authors' League of America.

RICE, JAMES (1843-82). British novelist. Born at Northampton, Sept. 26, 1843, and educated at Queen's College, Cambridge, he became a barrister in 1871. In 1879 he published a *History of the British Turf*, an eminently readable if not strictly historical work. His fame rests, however, on his collaboration in writing novels with (Sir) Walter Besant, a partnership which began with *Ready Money* Mortiboy in 1872. Their joint works include *This Son of Vulcan*, 1876; *The Golden Butterfly*, 1876, most successful of all; *The Chap-*

lain of the Fleet, 1881; *The Seamy Side*, 1881. Rice died at Redhill, April 20, 1882.

Rice Bird. Popular name for the bobolink (*q.v.*). The name is also applied to the Java sparrow, commonly seen in aviaries.

Rice Flower (*Pimelea*). Genus of trees and shrubs of the family Thymelaeaceae, natives of Australasia. They have opposite or scattered leaves, and tubular flowers, mostly in clusters or dense heads, at the tips of the annual shoots. They are cultivated as greenhouse plants, the best known being *P. spectabilis* with white



Rice Flower. Stalks with foliage and flowers of this Australasian shrub

flowers in dense globular heads, surrounded by bracts with coloured margins. *P. ferruginea* has similar heads of rosy flowers.

Rice Paper. Thin, delicate paper, used by Eastern artists. It is made from the pith of *Tetrapanax papyrifer*, which grows wild in Formosa, also from *Aeschynomene* of China. Good artificial flowers are made from the paper. An edible paper used in confectionery is also made from rice straw, as are some cigarette papers. See Paper.

Rice-paper Plant (*Tetrapanax papyrifer*). Shrub of the family Araliaceae. A native of Formosa, it grows to a height of about 8 ft., and has large, lobed, downy leaves and drooping clusters of greenish flowers. The thick cylinder of white pith from the stems is rotated against the edge of a long knife, which shaves it into an even sheet to form rice paper.

Riceyman Steps. Novel by Arnold Bennett. Published in 1923, this character-study of a miser was accepted as one of its author's outstanding works. The powerful naturalism and analysis of human motives with which Bennett invested *The Old Wives' Tale*, 1908, was here repeated on a less extensive scale. The scene was Clerkenwell, London, and the



James Rice,
British novelist

steps were in reality those in Granville Place, leading to S. Philip's church.

Rich. English titled family. It was founded by Richard, 1st Baron Rich (c. 1496-1567), of Leez or Lees, now Leighs, Essex, whose grandson, Robert (d. 1619), was 1st earl of Warwick of the 1618 creation. Of Robert's two sons, Robert (1587-1658), 2nd earl, was lord high admiral; Henry (1590-1649), knighted 1610 and created Baron Kensington, 1623, and earl of Holland, 1624, was beheaded, March 9, 1649. Charles (d. 1673), 2nd son of the 2nd earl, married Mary (1625-78), daughter of Richard Boyle, 1st earl of Cork, and became 4th earl of Warwick. Robert (d. 1658), only son of the 3rd earl, Charles's elder brother, Robert (d. 1659), married Frances Cromwell, youngest daughter of the Protector. Robert, 5th earl of Warwick, and the last Rich of Lees, was son of Henry, earl of Holland. See Warwick, Earls of.

Rich. SIR RICHARD RICHEL, 1ST BARON (c. 1496-1567). English statesman. After study at the Middle Temple, he became M.P. for Colchester, 1529, solicitor-general, 1533, was knighted in 1533, and appointed speaker, 1536. Raised to the peerage as Baron Rich of Leez, Essex, in 1546, he was lord chancellor, 1548-51, amassed wealth from monastic spoils, built at Little Leighs a mansion of which the gateway and other remains exist, and in 1564 founded Felsted grammar school. He died at Rochford, June 12, 1567, and was buried at Felsted. See Felsted School.

Rich. CHRISTOPHER (d. 1714). English theatrical manager. At one time Drury Lane, the Dorset, and the Haymarket Theatres in London were under his control. Notoriously mean to his players, he died Nov. 4, 1714. His son John (c. 1682-1761) opened the theatre in Lincoln's Inn, where pantomime was introduced to England, and founded the Beef-steak Society. Of him it was said that The Beggar's Opera "made Gay rich and Rich gay." He died Nov. 26, 1761.

Rich. CLAUDIUS JAMES (1787-1821). British Orientalist and traveller. Born at Dijon, March 28, 1787, and educated at Bristol, he entered the service of the East India Company, whose resident he was at Bagdad. He died of cholera, at Shiraz, Oct. 5, 1821. His Oriental collections were acquired by the British Museum.

Rich. EDMUND. Archbishop of Canterbury, who became a saint and is noticed as Edmund.

Rich. PENELOPE, LADY (c. 1562-1607). English courtier. She was the daughter of Walter Devereux, 1st earl of Essex; her mother was a daughter of Sir Francis Knollys and cousin of Queen Elizabeth. It was the earl's last wish that she should wed Sir Philip Sidney. In 1581, however, she married Robert, 3rd Baron Rich, who in 1618 became 1st earl of Warwick. The Stella of Sidney's sonnet sequence, Astrophel and Stella, after Sidney's death she lived with Charles Blount, 8th Baron Mountjoy, who was created earl of Devonshire in 1603 and married her in 1605 after her husband had divorced her. For this offence the couple were banished from court. Her brother Robert, 2nd earl of Essex, married Sidney's widow. Florio's translation of Montaigne was dedicated to Penelope. Consult P. R. and Her Circle, M. S. Rawson, 1911.

Richard. Masculine Christian name. Of Teutonic origin, it means stern or hard in ruling. It has long been popular in England and France, and in the form Ricard was used by the Anglo-Saxons before the Norman Conquest. Ricardo is the Italian form.

Richard I (1157-99). King of England. Third son of Henry II, he was born Sept. 8, 1157, and became popularly known as Coeur de Lion (Lion Heart). In 1170 he was given the dukedom of Aquitaine by his father. He and his equally turbulent brothers, Henry and Geoffrey, quarrelled ceaselessly with each other and with their father; in 1189, Richard was again at war with his father, when the latter died and Richard became king. He threw himself with ardour into the crusade being organized, and passed only six months of his reign in England, though he laid it under crushing taxation.

The dissensions and jealousies among the crusading princes and

nobles were intensified when Richard joined them in Palestine in 1191, though the capture of the fortress of Acre was mainly due to him. Richard by arrogance made half the princes permanently his enemies; in spite of brilliant feats of arms, he found the conquest of Palestine impossible, and in 1192 made a three years' truce with Saladin.

On his way home, to avoid passing through France, he tried in the guise of a simple knight to slip through the territory of his enemy, Leopold of Austria. But he was captured and handed over to the emperor, Henry VI, who made him a prisoner. Now came the legendary episode of the minstrel Blondel. In spite of the machinations of his brother John, Richard was released on payment of a huge ransom and returned to England in 1194. He magnanimously forgave John, but almost immediately left England once more in charge of the justiciar, Hubert Walter, while he betook himself to Aquitaine and sought to form a great coalition against the French king. In the midst of his schemes he attacked the vassal of an old enemy Ademar, and was mortally wounded while besieging the castle of Chalus, April 6, 1199. Richard was a superb warrior but a useless ruler. See Armour; Berengaria; Crusades.

Bibliography. Crusade of Richard I, T. A. Archer, 1888; The Angevin Empire, J. H. Ramsay, 1903; Richard the Lion Heart, K. Norgate, 1924; Richard Coeur-de-Lion, C. Wilkinson, 1933.

Richard II (1367-1400). King of England. The younger son of Edward the Black Prince, he was born Jan. 6, 1367, and succeeded his grandfather Edward III, as king of England, June 21, 1377. During his boyhood the government of the country was mainly in the hands of his uncles. In 1381 occurred the rising of the peasantry commonly called Wat Tyler's revolt. When all the authorities appear to have been panic-stricken, the boy king displayed a courage and presence of mind which saved a critical situation. He married Anne of Bohemia in Jan., 1382.

Richard sought to shake off the yoke of his uncles, but his own favourites



Penelope, Lady Rich
From a supposed portrait in Lambeth Palace



Richard I,
King of England



Richard II,
King of England

and those whom he chose to advise him were "appealed" of treason. Richard found himself obliged to submit, but in 1389 a successful *coup d'état* removed the controlling nobles from his council, and for eight years, advised by John of Gaunt and William of Wykeham, the king ruled with moderation and wisdom. He visited Ireland, and made peace with France, from which country came in 1396 his second queen, Isabella. But he had been nursing his revenge. Suddenly, in 1397, the group of nobles against whom his resentment was hottest—principally his uncle Gloucester and the earl of Arundel—were arrested for treason and put to death, or banished. There remained two whom Richard suspected, Henry of Hereford and Mowbray, duke of Norfolk. In 1398 both were banished. A cowed parliament had already bestowed upon Richard despotic powers which he now exercised arbitrarily. When Gaunt died he seized the inheritance of Lancaster, which should have passed to Henry of Hereford.

Then when Richard in 1399 had gone to Ireland, Henry returned to England to claim his inheritance and reform the government. Richard suddenly found himself deserted, was taken prisoner at Flint, Aug. 19, carried to London, and compelled to abdicate, Sept. 29, whereupon parliament declared Henry to be lawful king of England by right of descent. Richard was imprisoned in Pontefract castle, where he died or was murdered, Feb. 14, 1400. See *Appellants*; Henry IV; King Richard the Second; Peasants' Revolt; Pontefract; *consult* Life, H. A. Wallon, 1864; England under Richard II, De L. O'Leary, 1908; *Diplomatic Correspondence*, ed. E. Perroy, 1934.

Richard III (1452–85). King of England. The youngest brother of Edward IV, he was born Oct. 2, 1452, and usurped the throne of England, setting aside the lawful king, his nephew Edward V, June 26, 1483. Apart from traditions for which his enemies are responsible, his record until his brother's death had been that of an able soldier whose loyalty had never swerved. Yet by a series of absolutely unscrupulous actions between April 9 (when Edward IV died) and June 26, he struck down one after another of the men likely to stand in the way of his ambitions, and seized the crown.

The boy king and his brother were imprisoned in the Tower.

Richard started on a royal progress through the country, and the two princes disappeared. The



Richard III,
King of England

throne won by crime could be retained only by terrorism. The atmosphere became thick with conspiracies. Hopes of plotters centred upon the young earl of Richmond, Henry Tudor, Buckingham, who had helped Richard to his crown, raised a rebellion in Nov., 1483, but it collapsed, and Buckingham was executed. On Aug. 7, 1485, Richmond landed at Milford Haven, and on the 22nd Richard, deserted at the critical moment by professed supporters, was slain at the battle of Bosworth. This marks the end of the Wars of the Roses and virtually of the Middle Ages. For Shakespeare's tragedy, see *King Richard the Third*. *Consult* History of Richard III, Sir T. More, 1833; J. Gairdner, 2nd ed. 1898; Life and Character, Sir C. R. Markham, 1906.

Richard Alexander Walter George (b. 1944). British prince, second son of the duke and duchess of Gloucester, born Aug. 26, 1944.

Richard (1209–72). King of the Romans, known as Richard of Cornwall. Born at Winchester, Jan. 5, 1209, the second son of King John of England, he was made earl of Cornwall in 1225, and, after quarrelling with his brother, Henry III, led a crusade to the Holy Land in 1240. Declining the crown of Sicily in 1252, five years later he was elected king of the Romans, but had no effective power. Reconciled to Henry, he fought for him in the Barons' War, and was taken prisoner at the battle of Lewes, 1264. Liberated next year after Evesham, he died April 2, 1272. A biography by N. Denham-Young was published 1947.

Richard, FRANÇOIS MARIE BENJAMIN (1819–1908). French prelate. Born of the noble family of Lavergne at Nantes, he was educated for the priesthood at St. Sulpice, Paris, was vicar-general of Nantes, 1850–70, and bishop of Belley, 1871. In 1875 he became coadjutor to the archbishop of Paris, whom he succeeded in 1886, becoming cardinal, 1889. This staunch defender of Church rights against the state published *La Vie de la Bienheureuse*

Françoise d'Amboise, 1865. He died Jan. 29, 1908.

Richard of Bordeaux. Drama by Gordon Daviot (*q.v.*). This fine study of Richard II introduced a fashion for historical plays written in modern colloquial dialogue. It was first produced by the Arts Theatre Club at the New Theatre, London, June 26, 1932, and at the same theatre, Feb. 2, 1933, running for 472 performances. John Gielgud appeared as Richard, and Gwen Ffrangcon-Davies as Anne of Bohemia.

Richards, GORDON (b. 1904). English jockey. Born at Oaken-gates, Salop, May 5, 1904, son of a miner, he learnt to ride pit ponies, and had his first race in 1920. Champion jockey in 1925, he maintained that position for over 20 years, except when beaten by Fox in 1930 and when injured during 1926 and 1941. In 1933 he rode 259 winners, including twelve in succession, six all in one day at Chepstow; and in 1947 broke all records with 269 successes. By winning the 2,750th race of his career, on Scotch Mist at Windsor, April 26, 1943, he passed the total of Fred Archer (*q.v.*). Richards was five times first in the St. Leger, and in 1942 won all the classic races except the Derby. Early in 1950 he rode his 4,000th winner.

Richards, THEODORE WILLIAM (1868–1928). American chemist. He was born at Germantown, Pa., Jan. 31, 1868, and educated at Haverford, Harvard, Gottingen, and Leipzig. Successively assistant professor and professor of chemistry at Harvard during 1894–1922, he took over the directorship of the research laboratories in the latter year. He carried out precise determination of atomic weights, and for this work was awarded in 1914 the Nobel prize for chemistry. He was president of the American chemical society, the American association for the advancement of science, and the American academy of arts and sciences. He died April 2, 1928.

Richardson, SIR BENJAMIN WARD (1828–96). British physician. Born at Somerby, Leics, Oct. 31, 1828, and educated at Glasgow, he came to London, 1853, and was appointed physician to a number of hospitals. Associating



Gordon Richards,
English jockey

himself chiefly with sanitary reform, he founded the *Journal of Public Health and Sanitary Review*, *Hygienic Treatment of Pulmonary Consumption*, 1857; *Cause of the Coagulation of the Blood*, 1858; *Medical History and Treatment of Teeth*, 1860. Elected F.R.S. 1867, and knighted 1893, he died Nov. 21, 1896.

Richardson, HENRY HANDEL (d. 1946). Pen name of an Australian novelist. Daughter of a doctor, Henrietta Richardson was born at Melbourne, and having been educated there, studied music at Leipzig, which city provided the background for her first novel, *Maurice Guest*, 1908. In 1917 appeared *Australia Felix*, the first volume of the Australian trilogy, *The Fortunes of Richard Mahony*; its second part, *The Way Home*, was published 1925, and the last, *Ultima Thule*, 1929. Other works included a volume of stories, *The End of a Childhood*, 1934; and *The Young Cosima*, 1939, a study of Cosima Wagner, Bulow, and Liszt. The author married J. G. Robertson (1867-1933), who held the chair of German literature at London university. She died at Fairlight, Hastings, March 20, 1946.

As a novelist she was compared with Flaubert in her remorseless observation and detachment. The *Fortunes of Richard Mahony* placed her among the outstanding novelists of the 20th century. Its hero, the fastidious, egotistical Anglo-Irish doctor, is depicted with justice and penetration, and descriptions of the Ballarat country during the gold rush of the 1850s are recorded with sombre fidelity.

Richardson, SIR OWEN WILLIAMS (b. 1879). British physicist. He was born at Dewsbury, Yorks, April 26, 1879, and educated at Batley Grammar School, and Trinity College, Cambridge. From 1906 to 1914 he was professor of physics at Princeton university, returning to England to become professor at King's College, London university, a post he held until 1924. He then became director of research in physics, and carried out work on electron theory and thermionics. He was awarded the Nobel prize for physics in 1928, and was knighted in 1939. Among his numerous publications were *Electron Theory of Matter*, 2nd. ed., 1916; *Molecular Hydrogen* and its Spectrum 1933.

Richardson, SIR RALPH DAVID (b. 1902). British actor. Born at Cheltenham, Dec. 19,

1902, he was educated at Xaverian College, Brighton, in which town he first went on the stage in 1921 as



Sir Ralph Richardson, British actor

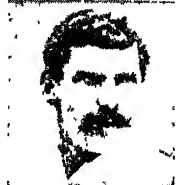
Lorenzo in *The Merchant of Venice*. He joined the Birmingham repertory in 1925, and next year was in *Yellow Sands*, at the Haymarket, London. During seasons with the Old Vic and Malvern festival companies, he acted Sir Toby Belch at the reopening of Sadler's Wells in 1931. He first appeared in New York in 1935, as Mercutio. By now a leading Shakespearian, he also made a hit as *The Amazing Doctor Clitterhouse*, and in 1939 gave a great performance in *Johnson Over Jordan*. He had been since 1933 in films, including *Friday the Thirteenth*, *Things to Come*, *South Riding*, *The Citadel*.

War service with the Fleet Air Arm was combined with propagandist pictures, but in 1944 Richardson rejoined the Old Vic at the New Theatre as joint director. With a rich and musical voice he played Peor Gynt, Bluntschli in *Arms and the Man*, Uncle Vanya, Cyrano, Face in *The Alchemist*, the inspector in *An Inspector Calls*, Dr. Sloper in *The Heiress*, and most memorably Falstaff. A notable later film was *The Fallen Idol*, 1948. Richardson married the actress Meriel Forbes in 1944, and was knighted in 1947.

Richardson, SAMUEL (1689-1761). English novelist. Born in Derbyshire, he came to London at 17 and was apprenticed to the printing trade, becoming by his industry a prosperous master printer, with the official appointment of printer of the journals of the house of commons. All his life Richardson displayed a partiality for ladies' society, and this predilection is reflected in his novels. His genius, however, matured late; it was not until he was over fifty that he turned his mind to novel writing. His first, *Pamela* (q.v.), or *Virtue Rewarded*, 1740, was cast in the form of letters—as,

indeed, were all his novels. *Pamela* was followed by *Clarissa Harlowe* (q.v.), 1748. In his third novel, *Sir Charles Grandison*, 1754, Richardson attempted to delineate a virtuous man. Few have excelled Richardson in knowledge of feminine psychology: he was much less at home in dealing with men. Though often prolix to an unconscionable degree, Richardson represents a notable landmark in the evolution of the novel. He died July 4, 1761. See *English Literature*; Fielding, H.; Salisbury Square; consult *Correspondence*, 6 vols., ed. A. L. Barbauld, 1804; Lives, C. L. Thomson, 1900; H. A. Dobson, 1902.

Richardson, THOMAS (1870-1912). An English professional cricketer. Born at Byfleet, Surrey, Aug. 11, 1870, he first played for his county against Essex in 1892. One of the fastest bowlers the game has produced, he took part in test matches in England against the Australians in 1893 and 1896, and toured with English teams in Australia, his bowling analysis for international games being 88 wickets at an average of 25.22 runs. He died July 3, 1912.



T. Richardson, English cricketer

Richborough. British seaport. Situated on Pegwell Bay at the estuary of the Stour, it lies between Ramsgate and Sandwich, 1½ m. N. of the latter town. Called Rutupiae in Roman times, it was then the principal port of entrance to Britain and was a military station guarding the S. entrance of the channel then stretching between it and Reculver and separating Thanet from the mainland. The ruins of the castle built by the Emperor Claudius in A.D. 43 include a wall 460 ft. long and 32 ft. high. In the centre of the ruins is a mass of stonework and rubble, called S. Augustine's Cross, in allusion to the tradition that S. Augustine landed there. It is more probable that the relic originally supported a lighthouse. During the centuries the port gradually disappeared in the salt marshes. In 1916, to relieve the First Great War traffic passing through Dover, a new port was built at Richborough and eventually covered an area of 2,200 acres and included a mile of wharves. In 1917 a cross-Channel goods train ferry was established for direct shipments to France. The dock facilities were



S. Richardson

After J. Highmore

taken over in 1921 by the Port of Queenborough development co., which maintained the train ferry between the wars. In the Second Great War Richborough again became a military port. Units of Mulberry (*q.v.*) and Pluto (*q.v.*) were fabricated there, and it was one of the embarkation points for the invasion of June, 1944.

Riche OR **RICH**, **BARNABE** (c. 1540-1617). English romance writer. He fought as a soldier in Flanders and Ireland, later living in Dublin. He died Nov. 10, 1617. His 20 or 30 works were modelled more or less on Lyly's Euphues, and borrowed from Bandello and other Italian novelists. Riche, His Farewell to the Militarie Profession, 1581, contained the story of Apollonius and Silla, from which Shakespeare derived the plot of Twelfth Night.

Richelieu. River of Quebec, Canada. It issues from Lake Champlain, and, flowing N. about 80 m., falls into Lake St. Peter, an expansion of the St. Lawrence, at Sorel. It is part of the waterway between the St. Lawrence and the Hudson, and is navigable for large vessels. The river is also known as the Chambly and the St. John.

Richelieu, **ARMAND EMMANUEL SOPHIE SEPTÉMANIE DU PLESSIS**, **DUKE OF** (1766-1822). French statesman. Born in Paris, Sept. 15, 1766, he served under the tsar of Russia during the French Revolution, and as governor of Odessa raised it from a small town to an important city. Returning to France at the Restoration, he succeeded Talleyrand in 1815 as premier, and mainly as a result of his influence with the tsar obtained the complete evacuation of French territory at the congress of Aix-la-Chapelle in 1818. That year he resigned, and though he again assumed office in Feb., 1821, his failure to steer a successful middle course between the liberals and reactionaries led to his fall in Dec. He died May 17, 1822.

Richelieu, **ARMAND JEAN DU PLESSIS**, **DUKE OF** (1585-1642). French statesman and ecclesiastic. Of a noble family in Poitou, he was born Sept. 5 or 9, 1585, and at 20 was given the bishopric of Luçon in his father's preferment. Being under age, he went to Rome for a dispensation, and was consecrated in 1607. In 1614 he was chosen a clerical deputy to the last states-general called before the French Revolution. He obtained the post of almoner to Anne, queen of Louis XIII.; then through the influence of Concini became secre-

tary to the king. The murder of Concini in 1617 was followed by banishment of his friends, but the queen mother at Blois valued Richelieu's services. He arranged the treaty by which she was to administer Anjou and Normandy, and when she returned to royal favour she saw her favourite placed on the council.



De Richelieu

After P. de Champaigne

By 1624 he was virtually chief minister, and was appointed such in 1629. He received the red hat in 1622 and a dukedom in 1631. Once established, Richelieu presided over the destinies of France till his death, Dec. 4, 1642. Cold, cruel, petty, and avaricious, he aroused enmities. He had to crush conspiracies, those of Gaston of Orleans from 1626 to 1632, that of Cinq-Mars in his last year. He suffered from painful ill-health. But he was courageous, determined, amazingly competent; and thanks also to a wonderful system of spies, and the loyalty of the king (who detested Richelieu personally), he triumphed every time.

Richelieu's policy had one root and three branches. France was to be made great, by concentrating power in the hands of an absolute monarch and his minister; by making domestic strife to cease with the granting of religious toleration; and by capturing the control of international diplomacy from the Hapsburg empire. Therefore the nobility was shorn of effective power; fortified castles were demolished;

local administration was given to civil servants. The Huguenots were crushed at the siege of La Rochelle, 1629, not as heretics but as rebels, and then were allowed to enjoy their form of worship and many civic privileges. Until the struggles at court ended with the cardinal's triumph on the "day of dupes," Nov. 11, 1630, he could not intervene actively in the Thirty Years War, but then came masterly intrigues. Richelieu gave subsidies to opponents of the Hapsburgs, even the Protestant king of Sweden. His agent, Father Joseph, procured the dismissal of the best imperial general, Wallenstein. His armies seized Roussillon, Catalonia, and Savoy, and threatened the Milanese. After his death, Condé's victory over the Spaniards at Rocroi, and the treaty of Westphalia which maintained the partition of Germany, were the fruit of Richelieu's efforts.

The cardinal rebuilt and endowed the Sorbonne, where he was buried. He founded in 1635 the French Academy. Among much that he wrote, his memoirs (5 vols., 1907-22) remain interesting. For good and ill, his significance for France can scarcely be exaggerated; without him, she would have known neither the glories of Louis XIV nor the stifling of political development which at last bred revolution. He is drawn unflatteringly in Dumas's novels; and there are biographies by G. Hanotaux, 1893; E. C. Price, 1912; K. Federn, Eng. trans. 1928; H. Belloc, 1930.

Alan Phillips

Richelieu. French battleship. Laid down July, 1935, she was built at Brest and completed July, 1940. Displacing 48,500 tons fully laden on a length of 794 ft. and a beam of 108 ft., she was powered by geared turbines developing 150,000 s.h.p. to give her a maximum speed of 30 knots. Her armament consisted of eight 15 in., nine 6 in., twelve 3.9 in., seventy 40 mm., and forty 20 mm. guns, and she carried a complement of 1,946. Richelieu was one of the Allied battleships off the River Plate when the Graf Spee was scuttled. After the Franco-German armistice she took refuge at Dakar (*q.v.*), where on July 8, 1940, she was attacked by the Royal Navy and severely damaged. Following the N. Africa landings, she was sent to the U.S.A. for repairs and later joined the British Mediterranean Fleet.

Richepin, **JEAN** (1849-1926). French poet, dramatist, and novelist. He was born at Médan, Algiers

Feb. 4, 1849, fought as a franc-tireur in the war of 1870, and led a roving life before turning to literature.

As a poet he has been summed up as "frankly, boldly, and insolently a romantic"; in many of his stories he is a realist, while in



Jacques Richepin

his earlier writing he displayed a brutal coarseness. This in *Chansons des Gueux*, 1876, led to his being fined and imprisoned for an outrage against manners. His many novels include *Les Morts Bizarres*, 1876; *Le Pavé*, 1883; *La Miseloque*, 1893; *Contes Espagnols*, 1901; *L'Aile*, 1911. Among his plays are *Nana Sahib*, 1883; *Le Filibustier*, 1888; *Par le Glaive*, 1892; *Don Quichotte*, 1905; *La Route d'Émeraude*, 1909. He died Dec. 12, 1926.

His son, Jacques Richepin (1880-1946), poet and dramatist, established his reputation with *La Reine de Tyr*, 1899. Other works included *La Cavalière*, 1901, and *Falstaff*, a play in verse based mainly on incidents from Shakespeare. He married Cora Laparcène, and with her directed the Renaissance and Mogador theatres in Paris. He died Sept. 2, 1946.

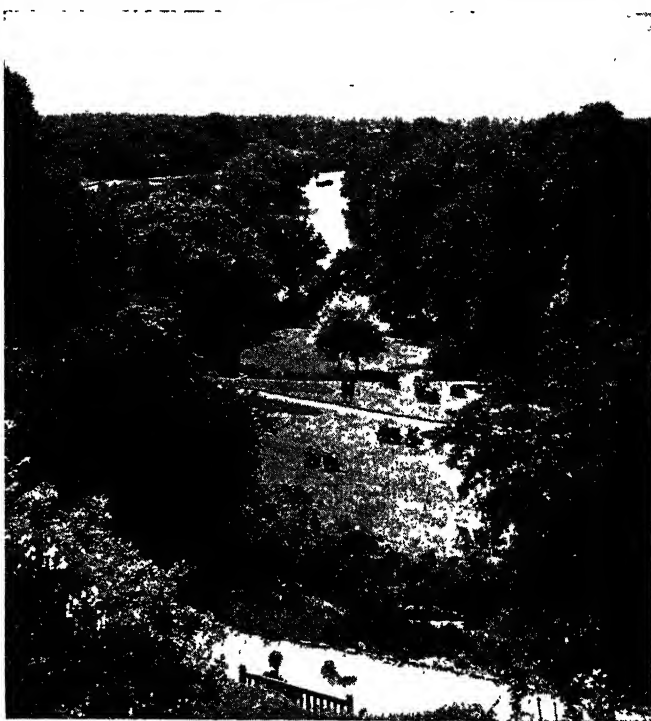
Richet, CHARLES ROBERT (1850-1935). French physiologist. He was born in Paris, Aug. 26, 1850, and educated there. He became professor of physiology at Paris university in 1887, and attracted attention by his discovery of the susceptibility of animals and men to consecutive injections of foreign proteins—a phenomenon known as anaphylaxis. For this work he was, in 1913, awarded the Nobel prize for medicine. He also did valuable work on serum therapy, and edited the *Revue Scientifique*, and wrote, in collaboration, a dictionary of physiology. Richet died in Paris in 1935.

Richmond. Municipal bor., giving its name to a bor. constituency, of Surrey, England. It is

on the slope of a hill, 9 m. S.W. of Hyde Park Corner, and has excellent connexions with London by railways and bus. The borough, which includes Kew, Petersham,



Richmond, Surrey, arms



Richmond, Surrey. The famous view of the River Thames, looking upstream, from the Terrace Gardens

and part of Mortlake, was incorporated in 1890. Richmond proper, bordered N. by Kew Gardens, W. by the Thames, E. by Mortlake, and S. by Petersham, is famous for its associations with royalty and as the home of poets, writers, and painters, among them Chaucer, Bacon, Sir W. Temple, Thomson, Pope, Swift and Stella, Reynolds, Turner, and George Eliot. Its pop. has grown from about 15,000 in 1876 to about 40,000 in 1948.

Originally known as West Sheen (A.S. *schene*, shining) and once a hamlet of Kingston, Richmond owes its name to Henry VII, who was earl of Richmond, Yorks, and has been a royal manor since 1320.

The manor house was converted by Edward III into a palace, destroyed by fire 1499, rebuilt by Henry VII, and dismantled in the 18th cent. Elizabeth, once a prisoner here, died in the palace. The

remains of the palace were restored, 1913-19. The Old Deer Park is now the venue of the Richmond horse show, football, golf, hockey, and other sports. The observatory, 1768, is used for meteorological work. Near it was a Carthusian

priory founded by Henry V. Edmund Keen was lessee of a theatre which stood near the Green. Maids of Honour Row was built for the ladies of Caroline's court. The local Maid of Honour cakes are a kind of cheese cake made since 1823.

The terrace gardens, public since 1886, command a magnificent view. Near by stood the famous Star and Garter hotel, founded in 1738 and



Richmond. Part of the palace rebuilt by Henry VII, where Queen Elizabeth died
Humphrey Joel

pulled down in 1919 to make room for a home for disabled soldiers and sailors. Among the public buildings is the town hall, 1893. The parish church of S. Mary Magdalen, frequently altered, has some interesting monuments and a massive

stone tower. The poet Thomson was buried in Richmond churchyard. The heroine of the old ballad, the Lass of Richmond Hill, was Fanny l'Anson of Richmond Hill, Yorks. A stone bridge with five arches (1774-77) connects with Twickenham. *See* Ham. Kew; Petersham; Sheen; *consult* Royal Manor of Richmond, Bell, 1907; Bygone Richmond, Cundall, 1925.



Richmond, Virginia, U.S.A. White House of the Confederacy. Right, oldest house in Richmond, erected about 1836, now a memorial to Edgar Allan Poe who lived in the town



commerce, the state library, and the splendid cathedral of the Sacred Heart. The city has several monuments, including one to Washington in the capitol grounds. The Valentine museum has a fine archaeological collection, and the state library contains upwards of 100,000 vols.

Richmond is a place of many literary associations. Here Poe lived, and here the Poe foundation preserves relics of that ill-starred writer. The 20th century Richmond produced Mary Johnson, Ellen Glasgow, and J. B. Cabell. The city has become the greatest cigarette manufacturing centre in the world. It has been the state capital since 1779. For four years, 1861-65, it was the headquarters of the confederacy. Many battles were fought for its possession, and on April 2, 1865, it was finally evacuated after damage by fire. Pop. 193,042.

Richmond, EARL OF. Title bestowed on Edmund, son of Owen Tudor, by his half-brother Henry VI, and inherited by Henry Tudor, who became Henry VII (*q.v.*).

Richmond, GEORGE (1809-96). British painter. Born at Brompton, London, March 28, 1809, he studied under Fuseli at the R.A. schools. In his early career he was greatly influenced by Blake. He became A.R.A. in 1857 and R.A. in 1867. His portraits included those of Wilberforce, then



George Richmond, British painter
Self-portrait

bishop of Oxford, 1868; Keble, Macaulay, Faraday; and he also modelled a bust of Pusey, 1882. Richmond died March 19, 1896. The National Portrait Gallery possesses several of his works. *See* illus. to Dalhousie, Marquess of; Liddell, H. G.; Palgrave. Sir F.

Richmond, SIR WILLIAM BLAKE (1843-1921). British painter. Born in London, son of George Richmond, the painter,



Sir W. B. Richmond, British painter

Richmond. Mun. borough and market town of the N. Riding of Yorkshire. It stands on the left bank of the Swale, 50 m. N.W. of York, having a rly. station. The chief object of interest is the ruined castle, standing on a hill above the river. The magnificent keep and some other portions remain. The chief church is S. Mary's, which, like Holy Trinity, has been largely restored. The tower remains of a monastery of the Greyfriars. Modern buildings include the town hall and market hall. The grammar school is also modern, although the foundation dates from the 16th century. Richmond has an agricultural trade and some small manufactures. Races are held here. Near the town are the beautiful ruins of Easby Abbey.

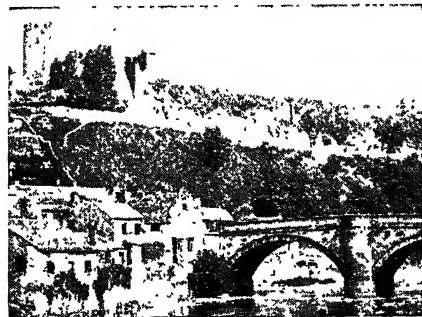
Richmond was the head of a large honour, and from here various princes took the title of duke. The castle was built by the Normans, and the honour became

crown property when Henry, earl of Richmond, became Henry VII. It had an M.P. 1584-1885, and now gives its name to a co. constituency. Pop. 4,769. *Consult* The Story of Richmond in Yorkshire, D. Brooks, 1948.

Richmond. City of Indiana, U.S.A., the co. seat of Wayne co. It stands on the Whitewater river, 70 m. E. of Indianapolis, on the Pittsburg, Cincinnati, Chicago and St. Louis, and other rlys. Agricultural machinery, motor vehicles, furniture, and pianos are manufactured. Founded in 1805 by veterans of the war of Independence, Richmond was incorporated in 1818 and became a city in 1840. Pop. 35,147.

Richmond. Borough of New York City, U.S.A. It covers an area of 59 sq. m., and is co-terminous with Richmond co., the whole of Staten Island. It is largely a residential district, was made a borough in 1898, and is still in its appearance much like old Dutch-settled New York. Pop. 174,441. *See* New York.

Richmond. City and port of entry of Virginia, U.S.A. The capital and largest city of the state, and the co. seat of Henrico co., it stands on the James river, 115 m. by rly. S. of Washington, and is served by the Southern and other rlys., and by ocean-going steamers. The capitol, after the Maison Carrée at Nîmes, stands on Shockoe Hill, in the centre of the city. Other buildings are the city hall, the chamber of



Richmond, Yorkshire. Ruins of the Norman castle and the bridge over the river Swale

Frith

he studied at the Royal Academy schools. Known first as a painter of portraits and historical subjects, he decorated the inner dome of St. Paul's with mosaics. He was Slade professor at Oxford, 1878-83; became A.R.A. in 1888 and R.A. in 1895; and was knighted 1897. His activities included a vigorous and partially successful crusade against the smoke nuisance in London; and the direction and championship of the arts and crafts movements in Hammersmith. He died Feb. 11, 1921.

Richmond and Derby, MARGARET, COUNTESS OF. Mother of Henry VII, and benefactor of Oxford and Cambridge. See Beaufort, Margaret.

Richmond and Gordon, DUKE OF. Title held by the family of Gordon-Lennox. Charles Lennox



5th Duke of Richmond and Gordon
After E. Wilkins

(1672-1723), natural son of Charles II by Louise de Kéroualle, was made duke of Richmond in the English peerage and duke of Lennox in the Scottish peerage in 1675. His son Charles (d. 1750), 2nd duke, was lord high constable of England at the coronation of George II, and inherited the French dukedom of Aiguillon, 1734. Charles, 4th duke (1764-1819), was lord-lieutenant of Ireland 1807-13, and governor-general of Canada 1818-19.

In 1860 Charles Henry (1818-1903) became 6th duke of Richmond, and in 1876 1st duke of Gordon. He had been Conservative M.P. for W. Sussex since 1841, and became president of the board of trade and party leader in the lords, 1867. Lord president of the council, 1874-80, he was secretary for Scotland in 1885. He died Sept. 27, 1903. In 1935 the titles came to Frederick Charles (b. Feb. 5, 1904), 9th duke of Richmond and 4th duke of Gordon. His principal estate is at Goodwood, Sussex, and his heir is the earl of March.

Richmond and Lennox, FRANCES TERESA STEWART, DUCHESS OF (1647-1702). Mistress of Charles II. Born July 8, 1647, daughter of a physician, she was educated in France, and, coming to England as a maid of honour to Catherine of Braganza, soon won the king's heart by her beauty. Charles's favourite from 1663, she made a runaway match in 1667 with the duke of Richmond and Lennox, but

returned to court in 1668. She remained there during the reign of James II, and died Oct. 15, 1702. Her wax effigy, in the robes she wore at Anne's coronation, is preserved in Westminster Abbey, where she was buried. Her beauty inspired artists and poets, and "la belle Stewart" was the original model for the figure of Britannia (q.v.) on British copper coins.

Richmond and Steveston. Municipality of British Columbia, Canada, at the mouth of the Fraser river, 6 m. S. of Vancouver. It includes Lulu and Sea Islands. Five rly. and traffic bridges on the N. arm of the Fraser connect with the mainland. Sea Island is the site of Vancouver airport. Steveston, on the S. tip of Lulu Island, is a centre of the salmon canning industry. Pop. 8,182.

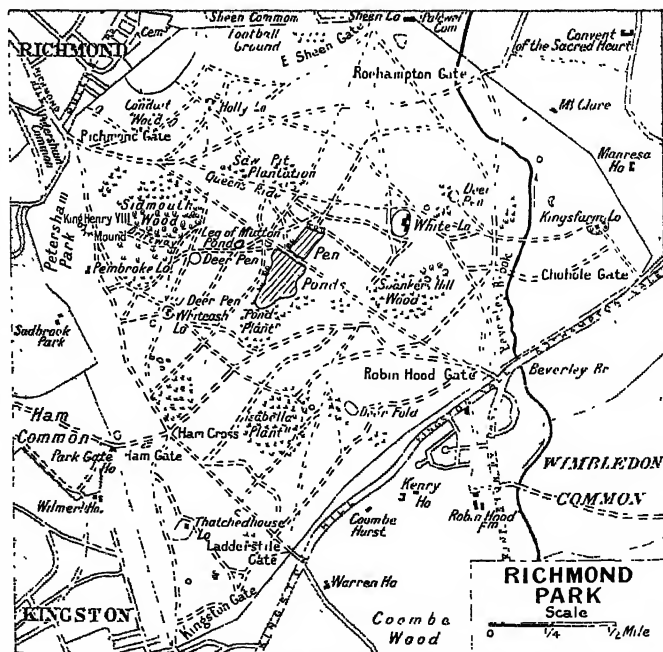
Richmond Park. Royal demesne of 2,250 acres in Surrey, England. It is bounded N. by Richmond, by Pethouse, Sheen, and Palewell commons, and by Mortlake; S. by Kingston and Coombe; W. by Petersham and Ham commons and Sudbrook



Frances Teresa,
Duchess of Richmond and Lennox

Park; E. by Kingston Hill, Kingston Vale, and Roehampton Vale. Easily the biggest and probably the most beautiful park near London, notable for its oaks, chestnuts, and birches, and undulating surface, it is stocked with red and fallow deer, and has two fine sheets of water, Pen Ponds, formed in the time of George II, and stocked with fish and water fowl. It contains White Lodge, the early home of Queen Mary and birthplace of the duke of Windsor; Pembroke Lodge, Sheen Lodge, and the Thatched House Lodge. There is a public golf course. Several motor roads go through the park.

Once known as Sheene Chase, Richmond Park was enclosed in 1637 by Charles I, for hunting purposes. In 1649 the park was granted to the City of London, but it reverted to the crown at the Restoration. In 1758 the public right of footway between Richmond, Wimbledon, East Sheen, and Kingston was maintained in the law courts by a Richmond brewer named John Lewis. Of the rangers, the 2nd earl of Portland was the first, Sir Robert Walpole the fourth, and the 2nd duke of Cambridge the 12th. The park was used in the Second Great War for experiments in the disposal of bombs. Consult History, C. L. Collett, 1937.



Richmond Park. Plan of the Royal park in Surrey
Based upon the Ordnance Survey map, with the sanction of the Controller of H.M. Stationery Office

Richter, HANS (1843-1916). Austrian conductor. Born at Raab (Győr), Hungary, April 4,



Hans Richter,
Austrian conductor

1843, he became a successful horn player and made the acquaintance of Wagner, who helped him to become chorus-master at the Munich opera, 1868. Richter conducted the first performance of Lohengrin at Brussels, 1870, and of The Ring of the Nibelungen at Baireuth, 1876, and accompanied Wagner to London in 1877. During 1875-97 he was chiefly in Vienna, but frequently in England, directing the Hallé orchestra. He died Dec. 5, 1916. His strong personality and wide technical knowledge made him the greatest conductor of his day; his friendship with Wagner made him an acknowledged authority on that master; and he was the first to present many works of Elgar, who dedicated to Richter his first symphony.

Richter, JOHANN PAUL FRIEDRICH (1763-1825). German author and humorist, often spoken of as Jean Paul. He was born March 21, 1763, at Wunsiedel, Bavaria. After studying theology at Leipzig, he determined to turn to literature; at 20 his Grönlandische Prozesse (The Greenland Law Suit) was issued by a Berlin publisher, but was a failure. Auswahl aus des Teufels Papieren (Extracts from the Devil's Papers), 1789, had little more success, but in 1793, with Die Unsichtbare Loge (The Invisible Opera Box), he won a first success; and Hesperus, 1795, made him famous.

Henceforth Richter was recognized as one of Germany's leading authors, and when he visited Weimar in 1796 and 1799 he was enthusiastically received. Other earlier works included Quintus Fixlein, 1796, translated into English by Carlyle in German Romance, 1827; Blumen, Frucht, und Dornenstücke (Flower, Fruit, and Thorn Pieces), 1796-97, trans. A. Ewing, 1892; and Das Kampaner Thal (The Campanian Vale), a discussion on immortality, 1797. In 1800 he visited Berlin, and there next year he married Caro-

line Meyer. In 1804 they settled at Baireuth. Later works included Titan, 1800-03, trans. C. T. Brooks, 1863, a romance which some critics, like the author, regard as his greatest work; Flegeljahre (Wild Oats), 1804-05; Levana, oder Erziehungslehre für Töchter, 1807 (Levana, or the Doctrine of Education for Girls, new ed. 1901); Schmelzles Reise, 1809 (Schmelzle's Journey, trans. by Carlyle in German Romance). Richter died at Baireuth, Nov. 14, 1825. One of the greatest of German writers, he influenced Carlyle's style. Richter's works were first collected in 65 vols., 1826-38. Consult Life, E. Lee, 1842; Humour and Humorists, P. Stapfer, 1911.

Richthofen Circus. Popular name of the Jagdgeschwader 11, or fighter squadron, commanded by Baron Manfred von Richthofen (1888 - 1918), German ace fighter-pilot of the First Great War. It was dubbed "circus" by the R. F. C. because of its gaudily-decorated machines and roving commissions. After Richthofen was shot down and killed in April, 1918, command of the circus passed to Hermann Goering (q.v.), one of its original pilots. There was also a Richthofen fighter-squadron of the Luftwaffe in the Second Great War.



Baron Manfred
von Richthofen,
German airman

Ricimer (d. A.D. 472). Roman general. Connected with the Visigothic royal family, he was brought up at Rome and soon attained high rank in the army. After defeating the Vandals by sea and land, in 456 he attacked the West Roman emperor Avitus, setting up Majorian in his place. From this time Ricimer, the Roman kingmaker, virtually ruled the empire for 16 years. In succession he installed upon the throne Libius Severus, 461; Anthemius, 467; and Olybrius, 472, in which year he died of the plague.

Rickets or **RACHITIS**. A disease of infants and children resulting from faulty diet and characterised by impairment of bone formation. Rickets occurs in all parts of the world, and is most prevalent among the poor children of large towns. Bad housing, overcrowding, insufficiency of food, and prolonged lactation are conditions conducive to the development of the disease, but the essential cause

is the bad functioning of the chemistry of bone growth, due largely to a deficiency of vitamin D in the diet, and the consequent failure of vitamin A, and calcium, effective only when vitamin D is present.

The symptoms begin insidiously, and are generally noticed about the sixth to ninth month. The child may have suffered from disturbance of digestion, and may have been irritable and restless. It shows a disinclination to walk, and is listless and peevish. There is a general soreness of the body, and the child cries when any attempt is made to move him. Slight fever, 100° to 101° F., is frequently present, and profuse sweating is a characteristic symptom.

As the disease progresses, changes in the bones become manifest. Their ends are enlarged, and they do not possess the normal degree of firmness, nor do they grow at the natural rate. The legs become bent, the spine curved, the sternum or breast-bone is thrown forward, and enlargement at the junction of the ribs with the costal cartilages produces a series of nodules down the front of the chest which is known as the "rickety rosary." The fontanelles or soft spaces between bones of the head remain open. The teeth often fail to erupt, or are decayed and imperfect. Some children become emaciated, while others remain well covered, but look pasty and flabby. Common complications of rickets are bronchial catarrh, pneumonia, bronchitis, and laryngismus stridulus. Enlargement of the lymphatic glands, disturbance of digestion, chronic diarrhoea, and other symptoms of general ill-health are often associated with the disorder.

If the disease is not treated in the early stages death may occur from complications, or, when adult life is reached, there may be serious and permanent deformity. The most important consideration in the treatment of rickets is the feeding. Fresh cow's milk should be given, suitably diluted and in sufficient quantity according to the age of the child. Cod-liver oil or halibut oil are essential remedies, being rich in the all-important vitamins A and D. Preparations of iron, phosphorus, and lime have their use in supplying the raw material needed for bone formation. Diarrhoea, if present, should receive the appropriate treatment. The child should be warmly clothed, given as much sunlight as possible, and should not be allowed to walk until the condition is im-



Johann Paul Richter,
German author

proved. If curvature of the bones has already occurred, the defect can often be corrected by wearing suitable splints. The condition was studied for many years before its cause was realised. The fact that poor children in fishing ports dipped bread in the oil produced when fish were being cleaned first suggested a solution.

Rickets is also the term applied to a disease common in certain breeds of dogs, notably bulldogs. It is caused by bad feeding, or a constitutional inability to deposit calcium salts in the growing bones. The bones most affected are those of the foreleg, especially the radius, which become bent forward and much distorted. The hind limbs may also suffer. The worst cases are in dogs in which there has been in-breeding. *See Dog.*

Ricketts, CHARLES (1866-1931). British artist. Born at Geneva, Oct. 2, 1866, he studied in Paris, founding a folio magazine *The Dial* in 1889, and acting as joint editor with Charles Shannon. In 1895 he started the *Vale press*, issuing a series of reprints



Charles Ricketts,
British artist

which gave great impetus to type design. He was elected R.A. in 1928; his best known paintings included *The Death of Don Juan* (Tate Gallery), and *The Plague* (Luxembourg). A fine draughtsman, he was also noted for woodcuts, many of which appeared in *The Dial*, pen drawings, and designs for the theatre: for instance, he redressed the *Mikado* for the 1929 Savoy season, and designed the costumes for Shaw's *Saint Joan* (q.v.). He died Oct. 7, 1931. His *Unrecorded Histories* appeared posthumously in 1933, and a *Memoir* by T. S. Moore the same year.

Rickmansworth. Urban dist. of Herts, England. It stands at the junction of the rivers Chess and Colne, 18 m. N.W. of London, with which there is connexion by Green Line and rly. It is also on the Grand Union Canal. S. Mary's is a modern church with some interesting internal features. The council offices are at Basing House, an 18th century mansion. On the outskirts are establishments making lorries, asbestos ware, and paper. There is picturesque scenery along the rivers Gade, Chess, and Colne. Near is Moor Park (q.v.). Population 25,000.

Rickshaw. Abbreviation of *jinricksha* (Jap. *jin*, a man; *riki*, strength; and *sha*, a car). Japanese vehicle seating one person and drawn by a hired man.

It was invented in 1869 by a Baptist missionary in Japan to provide employment for his converts. It now consists of an open, trap-like body with upholstered seat and hood mounted on pneumatic-tired rubber wheels. It is fitted with two shafts between which runs the coolie drawing it. The rickshaw was later introduced into China, India, Malaya, and S. Africa, where it plies for hire for short journeys. Rickshaw men in Durban, mostly Zulus, are noted for their elaborate feathered head-dress. Outside Japan, rickshaws sometimes seat two.

Ricochet. Term used in gunnery, when a gun is fired at a low elevation, and the shot often rebounds after striking the surface it first hits. Such a method of fire was once a recognized form of tactics in sea warfare, when round shot were used, and the ricochet shot did not rise much. The modern rifled projectile, however, tends to rise much more sharply after a ricochet, and so loses much of its chance of hitting an object. The term is also used in musketry. *Pron. rik-o-shay.*

Riddell, GEORGE ALLARDICE RIDDELL, BARON (1865-1934). British newspaper proprietor. Born at Duns, Berwickshire, May 25, 1865, he was educated in London, and became a solicitor in 1888. He secured an interest in several newspaper concerns, e.g. developing the circulation of

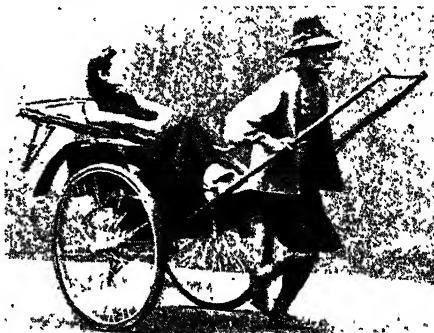


1st Baron Riddell,
British newspaper
proprietor

the *News of the World* from 30,000 to over 3,000,000. He succeeded Newnes as chairman and managing director of George Newnes, Ltd., and was also chairman of C. Arthur Pearson, Newnes and Pearson, and Country Life. At the Versailles conference, 1919, he acted as liaison officer between the British government and the press. His *War Diary*, and *Intimate Diary of the Peace Conference and After*, both appeared in 1933. Knighted

in 1909, he was raised to the peerage in 1920. He died Dec. 5, 1934, without an heir.

Riddle. A puzzling or enigmatical question. The most famous



Rickshaw. A single-seater rickshaw drawn by a coolie, as found in many parts of China

riddle is that supposed to have been propounded by the Sphinx: "What animal is that which goes on four feet in the morning, on two at noon, and on three in the evening?" The answer, discovered by Oedipus, was "man, for when an infant he creeps on all fours, when he has attained maturity goes on two feet, and when old uses a staff." Samson's riddle (*Judges 14*) may also be mentioned. The charade (q.v.) form has been popular in England since the 18th century, but there have been many later fashions in the style of riddle, e.g. the simple, punning riddle (Why should yellow peas be sent to Hammersmith? Because that's the way to Turnham Green); the "difference" riddle (What is the difference between a schoolmaster and an engine driver? One trains the mind, the other minds the train); the "likeness" riddle (Why is a moth flying round a candle like a five-barred gate? Because if it keeps on it sings its wings—its hinges it swings); and a double-punning form popular in the early 20th century (Why did the owl? Because the woodpecker would peck'er).

Riddle. For details of this agricultural implement, *see* Screen; Sieve.

Rideau. Lake, river, and canal of Ontario, Canada. The lake is 42 m. S.W. of Ottawa, and discharges into the river which joins the Ottawa river at the capital. The canal, built 1826-34 for military purposes, connects Ottawa with Kingston, on Lake Ontario, by means of the river and lake, and by connexions with Mud Lake and the Cataragui river. The canal is

126 m. long, and 5 ft. deep in the navigable channel.

Ridge, WILLIAM PETT (1860-1930). British novelist. Born at Chartham, near Canterbury, he was educated in Kent, and at Birkbeck College. His first novel, *A Clever Wife*, was delayed until 1895, but with *Mord Em'ly*, 1898, he established a reputation



Wm. Pett Ridge,
British novelist

for humorous and sympathetic studies of lower middle-class life in London. Later novels included *Erb*, 1903; *Name of Garland*, 1907; *The Bustling Hours*, 1919; *Ernest Escaping*, 1926. Pett Ridge's autobiography, *A Storyteller's Forty Years in London*, appeared in 1923. He died Sept. 29, 1930.

Ridgeway, SIR WILLIAM (1853-1926). British archaeologist. Born at Ballydermot, Offaly, Aug. 6, 1853, he studied at Trinity College, Dublin, and at Cambridge, where he became professor of archaeology in 1892. He was president of the Royal Anthropological Institute, 1908-10, and of the Classical Association, 1914. He was knighted 1919, and died Aug. 12, 1926. Among his works are *The Early Age of Greece*, 1901; *Who Were the Romans?*, 1907; *The Oldest Irish Epic*, 1907; *Dramas and Dramatic Dances of non-European Races*, 1915.

Ridgeway, THE. Prehistoric track following the line of the Berkshire Downs, England, from White Horse Hill to a point near Streatley. It runs parallel to and S. of the now metalled Icknield Way. This grass-grown track is unsurpassed for walking and practicable for cyclists.

Riding. Term applied to horsemanship, which may be broadly defined as getting the best work out of a horse for a given object, with a minimum of distress to horse and rider. Much has been written about "hands," i.e. the control of a horse by the rein, and more about "seat."

"Hands" cannot be acquired; the natural sensitiveness and responsiveness, together with the capacity for understanding the animal one is riding, are inborn. In the "seat" it is usual to endeavour to combine elegance with firmness. Cavalry and hack riders have the leg slightly bent, many cross-country riders prefer a

shorter stirrup, whereas the cowboy, who is as often in the saddle as on foot, rides with an absolutely straight leg. The cowboy, however, rides from his saddle, a massive and weighty article fashioned to meet the necessities of his calling. The Australian bushman, at least as good a horseman, rides with a different seat on an entirely different kind of saddle. The Red Indian, who rides barebacked, sits right forward on the withers, with the knees much bent when going at speed, in an attitude much like that adopted by the American jockey, Tod Sloan. In England one will best conform to the national school of riding by carefully observing the old jingle: "Your head and your heart keep up. Your hands and your heels keep down. Your knees keep close to your horse's sides, and your elbows close to your own."

The recognized paces of the horse are the walk, the trot, the canter, and the gallop. The trot is the natural pace as an alternative to the walk, and the acquirement of a good seat when trotting is the first object of the tiro horseman. The canter is of all paces the easiest to sit, and most delightful to the rider; unfortunately, it is injurious to the horse, inasmuch as the weight comes constantly on the same leg, and is on that account to be deprecated. Certain communities which spend much of their time in the saddle have succeeded in cultivating a modification of the canter, a "lope," in which this disability is remedied.

Riding has been divided into numerous heads, which vary with the judgement of the individual. Ordinarily the following classification is adequate. 1. Hacking, i.e. ordinary riding—on paths or along the road or over the downs, with no particular object but merely for the sake of being on horseback. 2. Hunting, i.e. riding across country to hounds, which makes the highest demands on the skill, nerve, and judgement of the horseman. 3. Military riding, under which rough riding may be included; this comprises all the horsemanship required by ordinary military duties, as well as the ability to ride across any kind of practicable country at speed. See illus. p. 6994.

C. E. Benson

Bibliography. *The Common Sense of Riding: Riding for Ladies*, N. P. O'Donoghue, new ed. 1905. *Riding*, R. Weir, new ed. 1905; *Modern Riding*, J. F. N. Birch, 1909; *Breaking and Riding*, J. Fillis, Eng. trans. M. H. Hayes, 2nd ed. 1911;

The Complete Horseman, W. S. Dixon, 1913; *Riding*, C. E. G. Hope, 1947.

Riding. Literally, the third part, a corruption of thridding. Of Scandinavian origin, the word was brought by the Danes into England, and just before and after the Norman Conquest a number of counties were divided into ridings with riding courts. Today the division still persists in the county of York, which is divided into three ridings, East, North, West. Each is an administrative county with its own lord-lieutenant and county council. See Yorkshire.

Riding the Marches. Form of beating the bounds (*q.v.*) carried out in Scottish and Border districts. Its purpose is to perpetuate the limits of parish and other boundaries, march being an old Anglo-Saxon word for boundary. The chief participants are the mayor or provost and other civic dignitaries, who ride round the area on horseback. In some districts the marches are now ridden in motor-cars.

Ridley, MATTHEW WHITE RIDLEY, 1ST VISCOUNT (1842-1904). British politician. Born in London, July 25, 1842, the son of Sir Matthew White Ridley, Bart., of Blagdon Hall, Northumberland. He was educated at Harrow and Balliol College, Oxford, and became a fellow of All Souls. In 1868 he entered parliament as a Conservative, and from 1878 to 1880 was under-secretary to the Home office, in 1885 becoming financial secretary to the Treasury. In 1895, having just failed to secure election as Speaker, he was made Home secretary. He retired and was made a viscount in 1900, dying at Blagdon, Nov. 28, 1904. In 1916 the title came to the 3rd viscount, also Matthew White Ridley (b. Dec. 16, 1903), who became regional controller for the N. under the ministry of Production in 1942.

Ridley, NICHOLAS (c. 1500-55). English prelate. Born in Northumberland, and educated at Pembroke Hall, Cambridge, he soon became prominent as a reformer. In 1537 he was appointed chaplain to Archbishop Cranmer, and was chaplain to Henry VIII and canon of Canterbury,



Nicholas Ridley,
English prelate

1541. He was canon of Westminster, bishop of Rochester, and, 1550, bishop of London, succeeding



7. Seat in gallop and, 8, in full gallop.
 Specially drawn by Charles M. Sheldon.

1. Preparing to mount. 2. Mounting. 3. Start of canter. 4. Seat at full canter. 5 and 6. Sitting and rising in saddle during trot. 7. Seating in gallop and 8, in full gallop. 9. Taking off for a jump. 10. Sitting back. 11. Preparing to dismount. 12. The dismount. See page 6993.

RIDING: MOUNTING AND THE CORRECT SEATS IN HACKING AND HUNTING

Bonner. In addition he held two country livings, and was one of the bishops who prepared the first prayer book of 1549. The foundation of S. Thomas's Hospital and of Bethlem (Bedlam) Hospital was due to his initiative. When Edward VI died Ridley sided with Lady Jane Grey, and was committed to the Tower by Mary at her accession. In 1554 he was condemned for heresy, and with Latimer was burnt at Oxford, Oct. 16, 1555.

Ridolfi Plot. Conspiracy in 1571 to marry Mary Queen of Scots to the 4th duke of Norfolk and place her on the English throne instead of Elizabeth. Roberto di Ridolfi (1531-1612) was a Florentine who settled in London, then visited Alva in Brussels, the pope, and Philip II in Madrid to gain their help in forwarding the scheme. But his agent Baillie was seized on landing at Dover, and Norfolk and other plotters were executed.

Riebeckite. Rock-forming mineral, one of the alkali amphiboles. It is a complex silicate of sodium and iron. It occurs as blue to black prismatic crystals and grains in acid igneous rocks rich in soda. Crocidolite, one of the types of commercial asbestos, is probably a variety of riebeckite, which on alteration gives rise to the Cat's Eye or Tiger's Eye used for ornaments.

Riego y Nuñez, RAFAEL DEL (1785-1823). A Spanish soldier. Born in Asturias, he early showed a patriotic spirit, and joined the forces which were fighting against France. He was, however, soon taken prisoner and spent some years in captivity. He returned at the peace of 1815, and was the leader of the insurrection of 1820, after which he held high positions in the state, being president of the cortes in 1823. That year he was again taken prisoner by the French, handed over to the royalists, and executed at Madrid, Nov. 7. The hymn of Riego is one of the most popular of Spanish songs, especially among republicans and revolutionaries.

Riel, LOUIS (1844-85). Canadian rebel. Born at St. Boniface, Manitoba, Oct. 23, 1844, he was partly of Indian descent. In 1868, he came to the front as the leader of those who disliked the transference of the Hudson Bay territories to the new dominion. The malcontents, having seized Fort Garry, called a convention and chose Riel as president of the government they set up. By them an Orange-



Louis Riel,
Canadian rebel

a member of the dominion parliament. He was expelled, again elected, and then outlawed, after which he passed some time in retirement, partly because of his mental condition. In 1885, however, he was asked by the half-breeds to champion their cause; a rebellion ensued, and, that having been crushed, Riel surrendered. He was found guilty of treason, and hanged at Regina, Nov. 16, an event which aroused hot passions.

Riemann, GEORG FRIEDRICH BERNHARD (1826-66). German mathematician. Born at Breselenz, Hanover, Sept. 17, 1826, he studied mathematics at Göttingen, where he was a pupil of Gauss, and at Berlin, under Jacobi. He successively became privatdocent, 1854, adjunct professor, 1857, and professor, 1859, at Göttingen, and died July 20, 1866. Riemann was one of the most brilliant mathematicians of the 19th century. He suffered ill-health and was severely handicapped by poverty, but despite these drawbacks his work on non-Euclidean geometry (*v.i.*) was outstanding.

Riemannian Geometry. A non-euclidean differential geometry developed by G. F. Riemann in the mid-19th century. Gauss had shown that certain properties of a two-dimensional curved surface embedded in euclidean three-dimensional space could be expressed in terms which did not involve the third dimension in which the surface could be seen to be curved. Such properties are said to be intrinsic properties of the original surface or space of two dimensions; they include a measure of the curvature at any given point, the properties of geodesics, etc.

Riemann saw that similarly a space of three dimensions might be found to be curved in a fourth dimension, and hence to be non-euclidean. He then proceeded to generalize Gauss's ideas to spaces of any number of dimensions and with any assigned quadratic differential form determining the metric. His work provided the basis for Einstein's General theory of Relativity, in which gravitation

is replaced by the geometrical conception of curvature in a four-dimensional continuum.

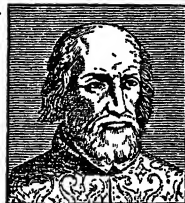
Rienzi, COLA DI (c. 1313-54). Roman patriot. The son of an innkeeper, he became a notary. Em-

bittered by the death of his brother, who had been murdered by a patrician, Rienzi threw all his energies into the cause of the people. A visit to Clement VI at

Avignon, 1343, brought him an official position and public notice. On Whit-sunday, May 20, 1347, Rienzi called a national council on the Capitol Hill. There he harangued the people, and was soon proclaimed tribune, asserting his jurisdiction over the other cities of Italy under the title of dictator. But when he cited the emperor and the electors to appear before him, he grew ridiculous; his popularity soon waned, and after a few temporary successes against the nobles he was crushed, Dec. 15, and fled. In 1354, after many imprisonments and vicissitudes, Rienzi was sent as senator to Rome by Innocent VI, but he had lost his following, and while attempting to quell a riot he was killed, Oct. 8. Bulwer Lytton made him the central figure of his romance Rienzi, the Last of the Roman Tribunes, which adheres closely to the facts and was written in Rome. On this Wagner based his opera Rienzi, produced in 1842.

Riesa. German town and river port on the Elbe, in Saxony, 33 m. N.W. of Dresden. Its 15th century castle, formerly a Benedictine convent, is now the town hall. A rly. and river junction and industrial centre, with steel, textile, and marble works, breweries, and agricultural trade, Riesa was before 1919 a military centre and training ground. Pop. 24,218.

Riesengebirge (Ger., giant mts.) Mt. range of Silesia and Czechoslovakia. It is 23 m. long, separating Polish-occupied Silesia from Bohemia. It forms part of the great Sudetic system, which extends from the Oder to the Elbe. Its outlines are undulating rather than rugged, while the valleys are extremely beautiful. The geological formation of the range is a blend of granite and gneiss. Highest peaks are the Schneekoppe, 5,260 ft., and the Brunnenberg, 5,120 ft.



Cola di Rienzi,
Roman patriot

Riesi. Town of Sicily, in the prov. of Caltanissetta. It is 14 m. S. of Caltanissetta, and is noted for wine and oil. Sulphur is worked in the adjacent mines.

Rieti. Italian city, in the prov. of the same name. The ancient Reate, it stands on the river Velino, 15 m. direct and 25 m. by rly. S.E. of Terni. It has a cathedral dating from 1456, and containing a statue by Thorwaldsen, and an episcopal palace of the 13th century. It trades in fruit, wine, oil, and cattle. Reate, which was a Sabine city, received the Roman franchise in 290 B.C. It suffered from earthquake in 1785 and was sacked by the papal troops in 1799. Rieti was undamaged in the Second Great War, the Germans withdrawing before the Allied advance in June, 1944. Pop. 34,769.

Rievaulx. Village of the N. Riding of Yorkshire, England. On the Rye, its name a corruption of Rye Vale, it is 3 m. N.W. of Helmsley. It is famous for the ruins of its abbey, the oldest Cistercian house in Yorkshire, founded about 1130. These remains consist of parts of the choir and transepts of the church, the refectory, chapter house, etc. The nave was cleared in 1920; it had six chapels, and two of their altars were found to be practically perfect. See Abbey.

Rif OR **ER-RIF.** Mountainous dist. in N. Morocco, bordering upon the Mediterranean. The mountains extend for about 180 m. from the W. frontiers of Algeria to the Jebel Hassan, S.W. of Tetuan, whence a N. spur, known as the Sierra de Bullones, runs towards Ceuta and terminates in the Jebel Musa. The country, which falls within the Spanish zone, is wild and difficult of access. The Berber tribes are turbulent, and have been in constant insurrection against Spain, especially during 1920-26. The principal port of entry is Melilla. See Morocco.

Rifle. Firearm of the musket type, having a grooved barrel in which the bullet is caused to rotate during its passage. The rotation is maintained during flight and increases the accuracy of fire. The invention of rifled sporting firearms occurred about 1500, and is

generally ascribed to Kottler of Nuremberg. It was, however, only slowly adopted for military purposes. The British learnt the value of the rifle in the American War of Independence, when they were opposed by large bodies of men armed with sporting rifles, and it became necessary to subsidise corps of Continental jägers, armed with rifles, to compete against the American marksmen.

After the war, the 60th Foot, later the King's Royal Rifle Corps, were rearmed with rifles, and in 1800 a new unit, the Rifle Brigade (*q.v.*), was formed and equipped with the new weapon.

Although more accurate than the musket, the early rifle was a difficult weapon to load efficiently owing to the difficulty of devising a bullet which would fit the rifling without jamming the barrel. The first bullets were made much smaller than the bore, dropped

and flame from the breech. In 1884 the German army introduced the first magazine rifle by fitting an eight-round magazine to the Mauser. Next year the French adopted the Lebel magazine rifle, which was the first to use a smokeless charge.

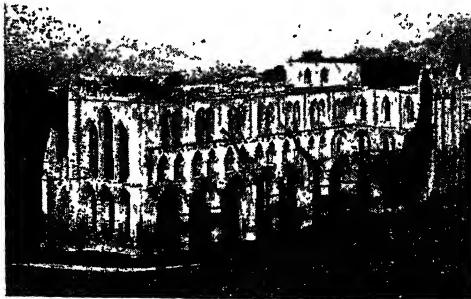
In 1886 Austria adopted a Mannlicher rifle provided with a Lee box-magazine into which the cartridges were loaded from a clip, thus introducing a principle found on every modern military rifle in practically unchanged form. All these military rifles fired a short bullet of a bore between .430 and .450. In 1883 Major Rubin, of the Swiss army, introduced a small calibre rifle using a longer bullet composed of a lead core in a copper case. The British government conducted experiments with this new type of projectile, and, as a consequence, adopted the .303-in. Lee-Netford rifle in 1888, an example followed by the other powers.

The success of the small bore rifle depended not only on the lessened air resistance of the projectile, but also on the introduction of smokeless powder. Calibres have varied little since this development, and now all military rifles are between .256 and .315 inch. About 1900 the rifles of all the powers were about equal as regards type and performance, but at that time a shorter weapon was successively introduced by Switzerland, Great Britain, and the U.S.A. These are considerably handier weapons than the longer type, but not quite so accurate for slow deliberate shooting, and all modern rifles with the exception of the French Lebel are capable of being loaded from clips.

Pointed Bullets

The next development was the introduction of the pointed bullet by the Germans in 1905, followed by France and the other powers. Owing to its greatly lessened air resistance, this bullet has a much flatter trajectory, so that the range with "fixed" or "battle" sights is increased from about 500 to 700 yards, and the "danger space" is very greatly increased. Muzzle velocities have risen to a maximum of 2,450 ft. per sec., which is that of the British service rifle.

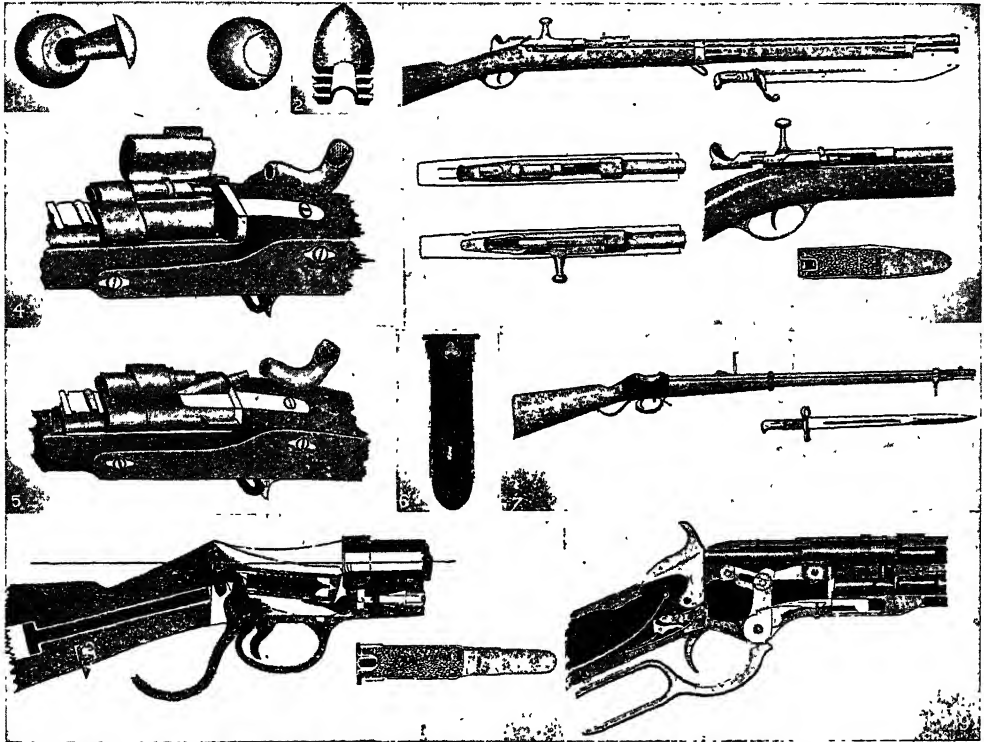
For sporting purposes, as previously mentioned, the rifle kept ahead of its military use, and many are made in much the same form as double-barrelled sporting shot-guns with bores from .280 to .600 in. Most of these fire a short bullet, and the majority employ smokeless powder, but this is not advis-



Rievaulx, Yorkshire. Ruins of the Cistercian abbey, from the south-east

down the muzzle and then hammered into the rifling when they reached the breech; this frequently resulted in a burst barrel when the charge was fired.

In 1835 W. Greener invented a new bullet of oval shape, smaller than the bore, with a hollow, flat, rear end, a tapered plug of hard metal being fitted in this hole. The explosion of the charge drove the plug into the bullet, expanding the latter in the rifling. It was not until Prussia introduced the breech-loading needle-gun in 1841 that an easily loaded rifle was evolved. This was followed by the French chassepot (*q.v.*). In 1866 the British army converted its muzzle-loading Enfield into a breech-loading rifle by the addition of the Snider breech-block. This rifle fired the Boxer metallic round, the charge being enclosed in a metal case and fitted to the case. A rim on the bottom of the case prevented the escape of gas



Rifle. Mechanism and cartridges of standard patterns. 1. Expanding bullet of Delvigne carbine. 2. Minié bullet. 3. French chassepot, showing bolt action and section of cartridge. 4. Snider bolt action open and, 5, closed. 6. Section of Boxer .577 cartridge. 7. Martini-Henry rifle and bayonet. 8. Breech mechanism of Martini-Henry and section of Winchester repeating rifle. 9. Action of Winchester repeating rifle

able in calibres in excess of .450. In addition, there is now a wide choice of magazine sporting-rifles of similar construction to the military types, with the exception of the fore-end being shorter and the finish better. Dum-dum ammunition is usually employed to give greater stopping power to the small bullet. Combination guns are also used, in which a rifled barrel is used in conjunction with one or two shot-gun barrels, and in other types special barrels provided with a short length of rifling near the muzzle, or special shallow rifling the whole length, are used for either shot or bullets. Combined rifle and smooth-bore guns are used for big-game hunting.

In order to reduce the cost of tuition the Morris tube was introduced, but this has now been almost entirely superseded by the miniature rifle, a weapon similar to the full size rifle in other respects, but firing a cartridge of .22 in. calibre with great accuracy up to 150 yards.

In firing, the rifle is gripped at the small of the butt by the right hand, the end of the first finger placed on the lowest point of the

trigger and the other fingers extended as far round the small of the butt as possible. The left hand should grip the rifle beneath the back-sight, fingers extended up the side and the rifle pulled well into the shoulder, the left elbow being vertically under the rifle. The sights used on rifles vary to a very considerable extent, but the majority of weapons are fitted with "open" sights, in which the back-sight is provided with a U or V groove, whilst the fore-sight is either a vertical leaf, a pyramid, or barleycorn.

In addition or substitution, "aperture" sights are sometimes fitted, the back-sight being a disk provided with a circular hole and the fore-sight a bead; whilst some sporting rifles have a telescopic sight, consisting of a small telescope conveniently mounted and fitted with cross wires in the field. Open sights are correctly aligned when the tip of the fore-sight is exactly level with the shoulders of the back-sight and appears exactly in the centre of the notch, whilst in the case of aperture sights the bead should be in the exact centre of the aperture. The sights, of

whatever type they may be, must then be alined on the lowest point of the object it is desired to hit, or what is known as "6 o'clock." The rifle is fired by squeezing the small of the butt with the right hand. This action will result in the trigger finger exerting a gradually increasing pressure, which will fire the rifle without disturbing the aim.

Owing to the gravitational fall of the bullet, the height of the back-sight is adjusted to allow for the fall at various distances, and the ability to judge the distance of the target from the firing point is most essential to successful shooting. Moreover, the allowance that must be made for the effect of wind on the bullet is a factor which requires much experience to estimate with accuracy. The employment of rifle fire in warfare introduces further problems, as it demands rapid and accurate fire, effectively controlled under difficult conditions. The secret of success in rifle shooting, whether for hunting, competition shooting, or warfare, lies in steady nerves, combined with physical fitness. See Bisley; Breechloader; Bullet;

Cartridge; Firearms; Gun; King's Prize; Lee-Enfield; Mauser; Musket; Propellant, etc.

Rifle Bird OR RIFLEMAN (*Phalaris paradisa*). Genus of birds of paradise. It is found in Australasia and New Guinea. It has purplish black plumage with green and bronze reflections, the throat being covered by a shield of feathers of a metallic lustre.

Rifle Brigade. Regiment of the British army. Raised in 1800 from marksmen drawn from a



Rifle Brigade badge

number of line regiments, the corps was numbered the 95th Foot and armed with rifles in place of the smooth-bore muskets then normally carried by infantry. Its original duty was scouting and covering the front of the army, making itself as inconspicuous as possible, hence its green uniform, an early instance of military camouflage. In field operations its movements were controlled by bugle, and that instrument occupies the central position on the regimental badge, as on that of all rifle regiments. At the time of his death in 1861, the Prince Consort was colonel-in-chief, in commemoration of which the regiment was granted the additional title of Prince Consort's Own.

Three additional battalions were embodied in 1805, 1855, and 1857, and the Rifle Brigade remains one of the only five line regiments to have a peace-time establishment of more than two battalions. The regiment saw its first active service in 1807, in the expedition to Monte Video, and in 1809 joined the Light Division in the Peninsula, where it won 16 battle honours, and was present at Waterloo. It served in S. Africa, 1846-47 and 1851-52; in the Crimea; the Indian Mutiny; the Ashanti expedition, 1873-74; the Afghan War, 1878-79; the Burmese campaigns of 1885-87; and at Khartoum. One battalion defended Ladysmith in the S. African War, while a second marched to its relief.

Twenty-one battalions of the Rifle Brigade were raised for service in the First Great War and earned the battle honours: Le Cateau; Neuve Chapelle; Ypres, 1915, '17; Somme, 1916, '18; Arras, 1917, '18; Messines, 1917; Cambrai, 1917, '18; Hindenburg Line; France and Flanders,

1914-1918; Macedonia, 1915-18. In the Second Great War, the regiment served in France, 1939-



Rifle Bird, an Australasian bird of paradise

40, and earned particular distinction in the defence of Calais. After Dunkirk the Rifle Brigade was converted into lorry-borne infantry and fought in armoured divisions in N. Africa, Italy, and N.W. Europe. The regimental depot is at Winchester.

Rifle Corps, KING'S ROYAL. Regiment of the British army. Raised on Christmas Day, 1755, as the 60th Foot, Royal American Regiment, it was originally recruited from naturalised Frenchmen, Swiss, Germans, and Tirolese in Pennsylvania and Maryland. From its inception the regiment had four battalions and spent its first 20 years fighting against the Indians and French in N. America. It was with Wolfe at Quebec in 1759, and at Martinique in 1762. After the American War of Independence the regiment came on to the British establishment, but continued to serve in Canada and the West Indies until 1809, when it joined Wellington's army in the Peninsula and won sixteen battle honours.

In 1824 thereg. was reorganized as a rifle unit and renamed the 60th Foot, Duke of York's Own Rifle Corps and Light Infantry. It fought in the Kaffir War of 1851-53, and during the Indian Mutiny took part in the siege and capture of Delhi. In the China War of 1860 it was at the capture of the Taku forts and the march on Peking, and in the Afghan War of 1879-80 marched with Roberts from Kabul to Kandahar. The regiment was at Tel-el-Kebir (1884) and in the S. African War shared in the defence of Ladysmith. In 1881 it received its present title.

Twenty-six battalions of the regiment were raised for service in the First Great War, and earned

the battle-honours: Mons; Marne, 1914; Ypres, 1914, '15, '17, '18; Somme, 1916, '18; Arras, 1917, '18; Messines, 1917, '18; Ephehy; Canal du Nord; Selle; and Sambre. In the Second Great War it was at the defence of Calais in 1940, and later served as lorried infantry with armoured divisions in N. Africa, Italy, and N.W. Europe. The regiment has the largest number of battle honours of any British unit. The depot is at Winchester.

Rifle Grenade. Grenade fired from a rifle by means of a discharger cup and ballistite cartridge. See Grenade.

Rifle Range. Stretch of land affording facilities for rifle practice with ball ammunition at various distances from the target. These distances are, for miniature rifles, from 25-100 yds., and, for service rifles, from 200 yds. up to 1,000 yds. or more. The targets on full-sized ranges are provided with good cover for the markers, and arrangements for raising and lowering the targets as required. There is also telephonic communication between the markers' shelter-pit and the firing-point in use, while the employment of flags reduces the risk of accident on the range to a minimum.

The butts which receive the spent bullets are massively constructed and fairly high, but recruits may send a shot singing over the butt, so that in open country a considerable area has to be kept clear while firing is going on. The roads and paths leading through the danger area are therefore patrolled, and a red flag is flown as an additional warning to wayfarers. In some cases the targets are placed against a hill-foot, or in a gravel pit, etc., thus giving complete safety to civilians behind the butts.

Indoor rifle practice and certain types of competition firing are conducted in indoor ranges under cover. Normally, miniature rifles of .22 calibre are used with miniature targets, the length of the range being 25 to 50 yds. For army indoor practice, ordinary .303 service rifles are used, but with a Morris Tube (*q.v.*) inserted in the barrel to permit the firing of .22 ammunition.

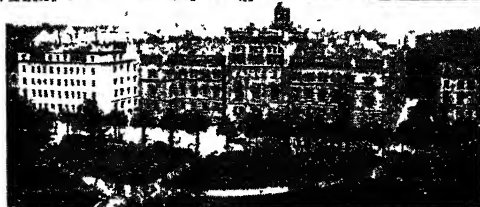
Rift Valley. Type of valley produced by the depression of a strip of the earth's crust between two parallel faults. The movement producing this type of feature is generally considered to be the result of down-dropping of the crustal strip owing to tension in the crust, as in (a); but some



King's Royal Rifle Corps badge

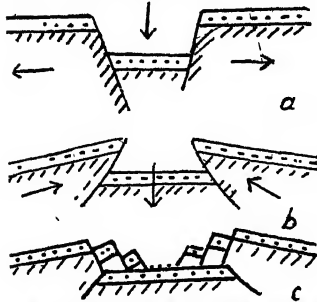


Riga, Latvia S.S.R. Panorama of the city from the river Daugava. Right, the university



geologists favour the idea of its being forced down while the crust on either side is thrust upward, as in (b). The overhanging portions naturally could not persist, and they would slide into the depression, giving the appearance of marginal down-faulting. Most modern rift valleys are sites of volcanic activity, the products of which cover the valley floors, and tend to mask the geological structure. The opposite of a rift is a horst.

Rift valleys are characterised by abrupt straight margins, which are fault scarps. With the exception of the Red Sea, they are usually from 20 to 45 m. wide. In Europe the Rhine valley is an example of a rift formed by tension. Rift valleys are important



Rift Valley. Diagram illustrating causes of rift formation: a, valley formed by down-faulting due to tension; b, valley formed by thrusting of sides over central strip; c, the same, after landsliding has occurred

features in E. Africa, where they include the valleys of Lakes Nyasa, Tanganyika, Albert, and Rudolf, and continue N. to the Red Sea, the Dead Sea, and Jordan valley. See Fault; Horst; Mountain; consult also Rift Valleys and Geology of E. Africa, J. W. Gregory, 1921; E. African Plateaus and Rift Valleys, B. Willis, Carnegie Inst. Washington, Pub. 470, 1936.

Riga. Capital of Latvia S.S.R. A Baltic seaport, on the river Daugava (Ger., *Duna*; Russian, *Dvina*), it is the third largest city on that sea, after Leningrad and

Stockholm. Its 1939 pop. was 393,211. In 1913 it was 517,500, but in 1920 had dropped to 120,000. The name is derived from an old Balt root meaning tortuous. Riga grew out of a trading centre and marketing village on the Viking trade route from Scandinavia to the Byzantine empire. Albert I, bishop of Livonia, established here his see in 1201. The town joined the Hanseatic League in 1282. It has been the victim and coveted prize in many wars since the conquest of Latvia by the Teutonic Knights in the 13th century. As capital of Livonia it was taken by Poles in 1582, Swedes in 1621, and Peter the Great in 1710.

In the First Great War Hindenburg from June, 1915, to Sept., 1917, tried unsuccessfully to take Riga, which was defended by Lettish rifle brigades of the Russian army. Here on Nov. 18, 1918, the independence of Latvia was proclaimed. Next year the new state met assaults from Bolsheviks on the E. and Germans on the W.; the former were in possession from Jan., but driven out in May by the Germans, whom the Allies ordered to quit in Nov. After 20 years of prosperity, Russian tanks entered Riga on June 17, 1940, and the government was replaced by Communist authorities, which were unable to hold the city against the Germans in July, 1941. Before this attack Riga had suffered both from German bombing aircraft and by the mass arrest on June 13-14 and deportation of thousands of citizens by the Soviet administration. Nazi occupation ended on Oct. 13, 1944, when troops of the 2nd and 3rd Baltic armies regained Riga.

During 1920-40 Riga was the seat of a university with eleven faculties, an academy of arts, conservatoire, opera, and research institutes. Its harbour received

vessels from N. and E. Europe; it was connected by rly. and air with Moscow, Berlin, and Warsaw. Besides the local produce and manufactures, Russian timber was exported; the imports were mostly machinery. Manufactures included rolling stock, radio sets, chemicals, dyes, textiles, paper, building materials, and foodstuffs.

Riga, GULF OF. Large shallow opening of the Baltic Sea. It is 90 m. long and 60 m. broad, and its chief affluent is the Daugava or Dvina. The N. shore is Estonian territory and the remainder Latvian. Outside the entrance lie the islands of Dagó and Oesel. Naval actions between Russians and Germans in the First Great War were fought here, Oct. 12-21, 1917. See Dagó; Oesel.

Riga, TREATY OF. Agreement signed between Russia and Poland on March 18, 1921, the negotiations having been transferred to Riga from Minsk. Each party recognized the other's sovereignty and agreed to refrain from propaganda and from harbouring organizations directed against the other. Art collections, libraries, and industrial installations removed by the Russians during the First Great War were to be restored to Poland; and Russia was to pay 30,000,000 roubles in gold as Poland's share of the assets in the former tsarist empire. Poland received territory amounting to about 44,000 sq. m., and her new eastern frontier roughly corresponded to that left after the second partition of Poland, 1793. See Poland and map.

Rigadoon OR RIGA UDON. French dance. A somewhat lively but complicated dance, traditionally said to have been invented by a dancing master of Marseilles

named Rigaud. Early in the 18th century it was danced in England to the tune of "Oh, Chloe, when I



prove my passion." It retained its place as a favourite dance in Paris until the Revolution, and is still performed at French village festivals. The music was in either triple or quadruple time. Grieg's Holberg suite ends with a rigaudon.

Rigaud, HYACINTHE (1659-1743). French painter. Born at Perpignan, he studied at Montpellier, and at the Academy, Paris. In 1687 he was admitted to the Academy as a portraitist, but did not qualify as an historical painter until 1700. In 1702 he became assistant professor, in 1710 professor, and in 1733 rector. He was created a nobleman of Perpignan in 1709, and died in Paris. Rigaud's principal achievement was in portraiture. Louis XIV, Philip V of Spain, Charles XII of Sweden, Augustus II and Augustus III of Poland were among his sitters, while he also portrayed many eminent artists and litterateurs of his time. See Bossuet; Fleury; Philip V of Spain.



Hyacinthe Rigaud, French painter

Rigby, SIR HUGH (1870-1944). British doctor. Born in Dublin, he was educated at Dulwich and London university, receiving his medical training at the London hospital. There he became house surgeon and house physician; surgical registrar; and finally assistant, full, and consulting surgeon. During the First Great War he was consulting surgeon to the B.E.F. in France, becoming surgeon-in-ordinary to the prince of Wales during 1923-36, and acting as serjeant-surgeon to George V during 1928-32. When the king was dangerously ill in 1928 Rigby performed the operation which saved his life. Knighted in 1918, he was created a baronet in 1929. He died July 17, 1944.

Rigby, RICHARD (1722-88). British politician, son of Richard Rigby, of Mistley Hall, Essex. His father's wealth enabled him to secure a seat in the house of commons in 1745. He soon became one of the followers of the duke of Bedford, the group being known as the Bloomsbury gang, and under its chief held political positions in Ireland. During 1768-

84 he was paymaster-general, accumulating great wealth while holding that office. Rigby died at Bath, April 8, 1788. Rigby in Disraeli's *Coningsby* is thought to be a pen portrait of J. W. Croker.

Rigel. Second star in the constellation of Orion, Beta Orionis. Its name means the foot. It is a first magnitude star, seventh in brightness in the heavens, and distinguished by its steel blue colour. The star is a spectroscopic binary, and it has been calculated to have a brightness equal to 8,000 suns. See Constellation.

Rigging. All the ropes and chains on a ship used to support or operate the masts, sails, etc. Standing rigging comprises the shrouds and stays which support the masts. Once fixed they are subject only to adjustment or renewal; they are made of wire or hemp. Wire ropes are painted or galvanised, hemp ropes are tarred, and, in both cases, they are wrapped with tarred or painted canvas and also wrapped more closely with marline or spun yarn.

Running rigging includes all the movable ropes or chains which are used in operating the upper masts, yards, sails, etc. The chief of these ropes, which are usually made of Manila hemp, are the braces by which the yards are controlled, and the halyards by which yards or sails are hoisted. The term rigging is applied to the whole system of cordage, masts, and sails of the ship; and also for the shrouds.

In its widest sense the rigging determines the character of a sailing ship. The earlier vessels were square rigged, with their sails arranged across the centre-line of the ship. Fastest vessels of this type were the clippers in the tea trade. See Ship; Tackle; Yachting.

Right. In political speech, the party or section of a party holding conservative views as opposed to the more radical ones of the left. Its use in this sense arose in France during the Revolution. When the national assembly formed itself at Versailles in 1789, the moderate men, quite by accident, found seats on the right of the hall, and the extremists on the left. This arrangement persisted and became part of the political system of France, so much so that the words right and left became synonyms for conservative and radical opinions respectively, and are so used in most democratic countries today. See Left; Politics.

Right Ascension. In astronomy, one of the two coordinates used to define the position of a

star in the sky. On the celestial sphere right ascension has the same significance as longitude has on earth. It is the angular distance between the star's hour circle and the hour circle which passes through the vernal equinox. It is conventionally measured E. from the equinox, sometimes in degrees, minutes, and seconds of arc, but more usually in hours, minutes, and seconds of time, an hour being equal to 15 degrees. The declination of a star together with its right ascension fixes its position. See Declination.

Right Honourable. This title is explained under Honourable.

Right of Way. In English law, a form of easement involving private right to pass over land in the possession of others. By the Prescription Act, 1832, it is enacted that uninterrupted enjoyment of a right of way for 40 years is an indefeasible right, on condition that it is proved by user down to the time of the commencement of the action, unless the consent in writing of the owner has been obtained to the enjoyment of the right. By the same Act "no claim by custom, prescription, or grant, to any way or other easement . . . which has been enjoyed twenty years without interruption shall be defeated by showing the commencement of the right within the time of legal memory."

A private right of way across a particular piece of land may be claimed by immemorial usage, or be granted to an individual by special permission. If an owner grant a piece of land in the middle of his field the grantee has the implicit right to cross the grantor's land without thereby committing trespass. This is called a way of necessity. Strictly speaking, a right of way means a private way, but in popular use the term is sometimes extended to include, for example, the right of the public to use a particular pathway through land in private ownership.

When a way of this kind has been enjoyed by the public without interruption for 20 years the way is a highway unless it is proved that there was no intention to dedicate it as a highway, or that there was at no time anyone in possession capable of dedicating it. If the way has been used for 40 years it is a highway unless the first alternative can be proved. In order to prove there was no intention to dedicate, the owner may put up a notice stating there is no such intention and may deposit with the local council a map of

the land showing what ways he admits are dedicated (Rights of Way Act, 1932). The National Parks Act, 1949, required co. councils to survey and map existing rights of way within three years, and empowered local councils to create rights of way by agreement or compulsion.

Rights. In political philosophy, privileges belonging to the members of a state or community. Of the various kinds of rights may be mentioned natural, civil, political, and religious. The origin, nature, and extent of these rights occupies a large place in the writings of political philosophers, such as Hobbes and Rousseau. In English history, the measure arranging the settlement of 1688 is known as the Bill of Rights. It was preceded by the Declaration of Rights. The term has been used also for other documents embodying the political ideas of a nation. A U.N. commission, set up in 1946 under the chairmanship of Mrs. Eleanor Roosevelt, adopted in June, 1948, a Declaration of Human Rights (with 28 articles), later to be referred to the General Assembly. See Bill of Rights; Rousseau; State.

Rights of Man, THE. Exposition of democratic doctrine by Thomas Paine (*q.v.*). The first part was published in London in 1791, and the second part in 1792. The author was tried before Lord Kenyon at the king's bench for issuing "a false, scandalous, malicious, and seditious libel," and although ably defended by Erskine, was found guilty, but fled to France, where the book had prepared him a warm welcome. Written as a reply to Burke's Reflections on the French Revolution, it is a vigorous defence of the principles which inspired that movement, had an enormous circulation, and was widely accepted among the less educated classes as a text-book of democracy, although its blatancy renders it greatly inferior to the contemporary and more scholarly work of William Godwin.

Rights of Man and of the Citizen, DECLARATION OF THE. French Revolutionary decree issued by the Assembly and forced on the acceptance of Louis XVI, Oct. 5, 1789. Founded on principles of political and social liberty, and pre-

known. They are characterised by the very large head and the absence of the back fin. The mouth is arched and contains long plates of whalebone. Of this group, the Greenland whale is not known with any certainty to have occurred



Rigi, Switzerland. View showing the peak of the mountain, 5,906 ft. high

scribing the relations of individuals to the law and constitution, the declaration embodied the spirit of the Revolution and finally abolished feudalism and the old social conditions. As the charter of the people's liberty, it has been the basis of almost all subsequent European constitutions. The chief articles declare that all men are born and remain equal in rights; that social distinctions can be tolerated only as far as they are for the public good; that every citizen has a right to participate personally or by his representative in the making of laws; that public burdens should be borne by the whole community in proportion to individual abilities; that none should be imprisoned except according to law, and that freedom of religion, of speech, and of the press are fundamental rights of the citizen. See French Revolution.

Right Whale (*Balaena*). Genus of whales, of which the Greenland whale *B. mysticetus* is the best

known. They are characterised by the very large head and the absence of the back fin. The mouth is arched and contains long plates of whalebone. Of this group, the Greenland whale is not known with any certainty to have occurred

in the British seas; but the Southern right whale was formerly common in the North Sea. See Whale. **Rigi.** Mountain mass of central Switzerland. It rises between the lakes of Lucerne, Zug, and Lowerz, and is mostly in the canton of Schwyz. It is 35 m. in circuit and has an alt. of 5,906 ft. Abrupt to the N., it slopes, with broad terraces, to the S., affording fine pasturage, while, lower down, fig and almond trees flourish. It is ascended by two mountain rlys., one from Vitznau on Lake Lucerne, and another from Goldau (*q.v.*); there are foot and bridle paths from these places. The summit of Rigi commands a magnificent panorama, embracing the 125 m. range of the snow-clad Alps, the Jura, the Vosges, the Black Forest, and parts of Württemberg and Bavaria. See Alps; Pilatus.

Rigidity (Lat. *rigidus*, stiff). Property of a body by which it resists change of form, the opposite of flexibility. It clearly distinguishes solids from fluids, for while the latter have rigidity in reference to volume, *i.e.* they resist increase or diminution of volume, they have none in regard to form. Nevertheless, a fluid in a state of rapid motion may acquire an apparent or temporary rigidity, as experienced with a jet of water issuing at high pressure from the nozzle of a fire hydrant. While all solids have some rigidity there is no known material which completely resists a change of form under stress. This deformation is



Right Whale. The Greenland whale, one of the largest sea mammals, spouting

proportional to the stress, while the ratio between the stress and the deformation is called the modulus of rigidity. In this type of elasticity there is no change in volume of the specimen. *See* Matter; Materials, Strength of.

Rigoletto. Opera in three acts by Verdi. The libretto by Piave was based on Hugo's *Le Roi s'Amuse*. It shows signs of the influence of Meyerbeer's *Robert the Devil*, and is one of the favourite works in the operatic repertory. It is generally accounted one of Verdi's masterpieces, and is notable for the aria *Caro Nome* (sung by the heroine Gilda) and the tenor aria *La Donna è Mobile*. *Rigoletto* was first performed at Venice, March 11, 1851, and at Covent Garden in 1853.

Rigor (Lat.). Severe fit of shivering occurring at the commencement or during the course of certain diseases, e.g. pneumonia, typhoid fever, and various forms of blood poisoning. It is due to toxic disturbance of the heat-centre of the brain.

Rigor Mortis. Stiffening of the muscles which occurs after death. It commences usually in the neck, jaw, and face, in about six hours, and is present over the whole body in from 12 to 18 hours. It passes off in the same order, and has generally disappeared in 36 hours after death. Exceptionally, it may come on very quickly after death, or may be delayed for several days. The limbs stiffen in the attitude in which they were at death. The contraction can be overcome by forcibly bending the joint, and when overcome it does not recur.

Before the onset of rigor mortis, the reaction of the muscles is alkaline, but during the period of rigidity it is acid, owing to the formation of sarcolactic acid. After the rigidity has passed off, the reaction is again alkaline. The onset of rigor mortis is hastened by exhaustion of the muscles before death, as in hunted animals, or soldiers killed at the end of a long march, and also by the exhaustion of a lingering illness; it is delayed where the muscular tone was good before death, and in persons in sound health who die suddenly.

The rigidity also occurs more quickly in young children and old people than in adults and the middle-aged. A warm temperature hastens the onset of rigor mortis, and a cold temperature delays it. Because of these numerous and varying factors an opinion as to the time of probable death is difficult to give accurately. Instantaneous

rigidity or cadaveric spasm is a condition which sometimes immediately follows death, and in which the muscles are firmly contracted in the attitude they were in at the moment of death. It is seen in cases where death was preceded by great nervous tension or excitement. Soldiers killed in battle have been found still holding their weapons, and a pistol or razor may be held in the hand of a suicide. *See* Death; Drowning.

Rigsdag. Scandinavian word for a national legislature, the equivalent of diet and the German Reichstag. The Danish rigsdag consists of two houses, the landsting or senate, and the elected folketing. *See* Denmark.

Rig-Veda (Sanskrit, praiselore). Name of the oldest section of the Vedas (*q.v.*). It is a collection of 1,017 hymns addressed to Indra, Agni, Varuna, Soma, the Maruts, and other nature gods. The compilation probably dates from about 1000 B.C., but the hymns themselves, to which many authors' names are traditionally appended, may be from 1,000 to 500 years older, and are the oldest literature in any Indo-European language. More than 10,000 verses in all, in a great variety of metres, they were composed in archaic Sanskrit, and handed down by word of mouth for many generations. Most of the hymns were uttered by professional priestly reciters on the occasion of sacrifices.

Some of the hymns appear to have been composed by the Aryans before they descended into the North Indian plain. Most, however, belong to the Punjab. Taken as a whole, they throw much light on the social life and ideas of the primitive Aryan communities, which were passing from the pastoral to the agricultural stage of culture. The father of each family was its priest. Women enjoyed a position of freedom and honour unknown later. The hymns are almost devoid of references to caste, and combine much puerility with occasionally sublime poetic imagination. They represent a stage in religious development, nowhere else so clearly seen, in which natural powers and phenomena are worshipped as persons, but no theology or mythological system has yet arisen, though the germs of later monotheism and pantheism are present. The Upanishads interpret the Rig-Veda in terms of philosophic mysticism. *See* Indra; Sanskrit; Vedas.

Rijeka. Yugoslav name for the city better known as Fiume (*q.v.*).

Riley, JAMES WHITCOMB (1853–1916). American poet. Born at Greenfield, Ind., Oct. 7, 1853, the son of a lawyer, he was by turns sign-painter and playwright before, in 1873, he began newspaper work in Indianapolis, contributing verse to



The Indianapolis Journal, and becoming known as "the Hoosier poet." His muse is genial, sympathetic, humorous, reflecting simple homely scenes and the charm of country life, notable examples being *An Old Sweetheart of Mine*, *When the Frost is on the Punkin*, *The Old Swimmin' Hole*, *Green Fields and Running Brooks*, *Thoughts for the Discouraged Farmer*, and *Poems Here at Home*. His songs for children achieved popularity. He died July 23, 1916.

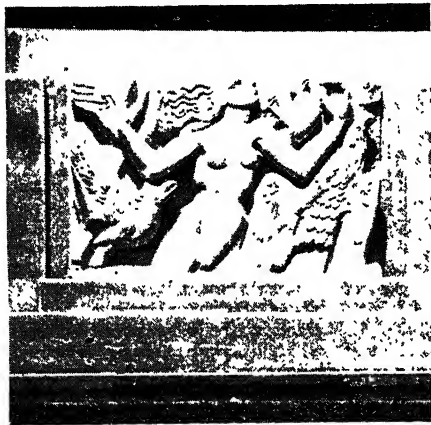
Riley, WILLIAM (b. 1866). British novelist. Son of a Yorkshire cloth merchant, he was born April 23, 1866, and educated at Bradford grammar school. He helped to inaugurate the business of optical lantern slide makers which was carried on in England and the U.S.A. by Riley Bros., and was managing director. The success of his first novel *Windyridge*, in 1912, led to a long series of other novels — mainly unpretentious, sentimental pictures of Yorkshire life. The *Windyridge* of the first book was based on Hawkesworth, near Guiseley, Yorks, and the book consisted of Crawford-like sketches of some of its inhabitants.

Rilke, RAINER MARIA (1875–1926). Writer of German poetry. Born in Prague, Dec. 4, 1875, he was intended by his father to become an army officer, but left the cadet school at 15. After a lonely and unhappy childhood he resolved to make literature his profession. He studied at Munich and Berlin, and paid two visits to Russia during 1899–1900. In 1901 he married the sculptress Clara Westhoff, and went to Paris, where for a time he acted as Rodin's secretary. He lived in Switzerland from 1919, and died near Montreux, Dec. 29, 1926.

Rilke had a lofty conception of the poet's function. He expressed his relationship with humanity in his *Stunden-Buch* (*Book of Hours*), 1908. Influenced by the Danish novelist Jacobsen, and particularly by Rodin, his *Buch der*

Bilder, 1903, revealed his strivings after objectivity and realism. The Note-book of Malte Laurids Brigge, completed in 1910, related in prose the obscure terrors of his childhood, and his experiences in Paris, which were expressed through an imaginary character. Later work, e.g. Duino Elegies (the first two of which were composed at Schloss Duino in 1912) and the 55 Sonnets to Orpheus, described in exquisite language the intangible world of man's vision, and the significance of hidden relationships. *Consult* Selected Poems, trs. J. B. Leishman, 1941; Letters, trs. and ed. by R. F. C. Hull, 1948.

Rima. Character, half human, half goddess of wild nature, introduced by W. H. Hudson into Green Mansions, a fantasy with a S. American forest setting. A bas-relief, depicting Rima, by Jacob Epstein, formed part of a bird sanctuary in Hyde Park, London, designed as a memorial to Hudson. Rima, carved in Portland stone, was depicted as a bird-like woman with outstretched arms. It was unveiled by Stanley Baldwin, May 19, 1925, and aroused violent controversy, being more than once tarred and feathered.



Rima. Bas-relief by Jacob Epstein, part of a bird sanctuary in Hyde Park, London, designed as a memorial to W. H. Hudson

Rimavská Sobota. Town of Czecho-Slovakia; formerly in Hungary. A rly. and road junction some 18 m. N.E. of Lesoncz, it is in the valley of the Rima, one of the small streams which flow from the Tatra Mts. Most of the inhabitants are Magyars, nearly half are Roman Catholics, the rest being almost equally divided between Calvinists and Lutherans. Pop. est. 7,000.

Rimbaud, JEAN NICHOLAS ARTHUR (1854-91). French poet.

Born at Charleville, Ardennes, Oct. 20, 1854, he went in 1871 to Paris, where he became friendly with Verlaine (*q.v.*). His possessiveness, which destroyed the latter's marriage, came to an end in 1873 with Verlaine's attempt to murder Rimbaud, who, after touring Europe with a circus troupe, went as a trader to Harar, Abyssinia, until illness forced him to return to Europe. He died at Marseilles, Nov. 10, 1891.

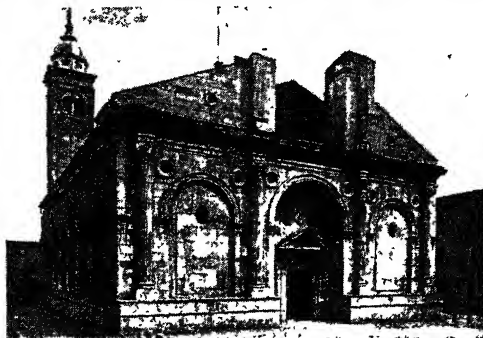
The majority of Rimbaud's poems were written before he was 20. The only work he published on his own initiative was a prose volume, *Une Saison en Enfer*, 1873. The eccentric power of such masterpieces as *Le Bateau Ivre*, written at 16, and the famous sonnet on the vowels greatly influenced the French symbolist movement, of which he became the acknowledged master. *Les Illuminations*, 1886, was published by Verlaine in the belief that Rimbaud was dead. His collected poems appeared in 1895. *Consult* Life, 1947, Rimbaud in Abyssinia, 1937, both E. Starkie; Rimbaud: the Myth of Childhood, W. Fowlie, 1946.

Rime. Accumulation of roughish, white crystals of ice, which may be found on trees, etc., when frost and wet fog occur together. The minute drops of supercooled water present in the fog freeze on coming into contact with solid objects, sometimes forming deposits which grow out to windward. A harder variety which consists of masses of ice on the vertical surfaces is associated with drizzle at temperatures below freezing point. In the U.K. rime is less frequent than hoar frost, which it resembles. *See* Frost.

Rime Royal. Stanza of seven decasyllabic lines, rhymed *abbacc*. It was established in England by Chaucer in his *Troilus* and largely used in the 15th and 16th centuries, notably by Thomas Sack-

ville, earl of Dorset, 1536-1608. The name is said to originate in the use of the form in The King's Quhair. In the 16th century the rime royal was revived with success by William Morris.

Rimini. City of Italy, in the prov. of Forlì. The ancient Ariminum, it stands on the river Marecchia, near its mouth in the



Rimini, Italy. Unfinished facade of the church of S. Francis, seriously damaged during the Second Great War

Adriatic Sea, 69 m. by rly. S.E. of Bologna. Successively Umbrian and Etruscan, the city fell to the Romans in 268 B.C. It has a triumphal arch to Augustus, badly damaged in the Second Great War, Roman bridge over the Marecchia, and ruins of an amphitheatre. A bishopric as long ago as 260, its cathedral was founded in the 13th century, rebuilt in the 15th, and severely damaged by air-raids in 1943. A monument indicates the spot where Caesar addressed his troops after crossing the Rubicon. The Palazzo Ruffo was the scene of the assassination of Francesca da Rimini in 1285. The library dates from 1617. Rimini has iron-works, silk mills, and mineral springs, while a trade is carried on in silk and sulphur. The fisheries are extensive.

The importance of Rimini under the Romans was chiefly due to its being the terminus of the Flaminian and Aemilian Ways. After a very chequered history it was held by the Malatestas from the 13th to the 16th century, when it was ceded to Venice. On the shore is a popular sea-bathing place. Pop. est. 60,000.

In the Second Great War, Rimini was the E. bastion of the German defence system known as the Gothic Line (*q.v.*), and about Rimini in Sept., 1944, the Allies encountered fierce resistance. R.N. destroyers bombarded transports and troop concentrations in the area in the first days of the month, and the Allied 8th army, com-

manded by Sir Oliver Leese, pushed forward from Pesaro, securing in bitter hand-to-hand fighting a large part of the Coriano-Sansovino ridge guarding the S. approaches to Rimini by the 13th. It was the 19th before Greek troops secured Rimini airfield, and the 21st before Rimini itself fell, much later than had been anticipated by

sakov in 1871 became professor of composition at St. Petersburg conservatoire. As conductor of Russian symphony concerts, 1886-1900, he gained a European reputation. He died June 21, 1908.

Both in his orchestral and operatic works Rimsky-Korsakov belongs to the nationalist school of Russian composers. In descrip-

Rinderpest is a common disease in South Africa, where, during one great visitation, nearly 80 p.c. of all cattle were destroyed.

The disease arises from a specific contagion, and it is believed that the infection enters the body of the animal through the mouth or nostrils, and thence spreads to all the organs. It is a fever, with very high temperature. The pulse quickens, the coat stares, the nose becomes dry, the whites of the eyes turn scarlet, appetite fails, and the animal is seized with shivering fits. Profuse diarrhoea usually follows, and as a rule inflammation of the lungs.

The infection may be spread by hay or straw, or by any form of litter, by hides, fleeces, or flesh. It



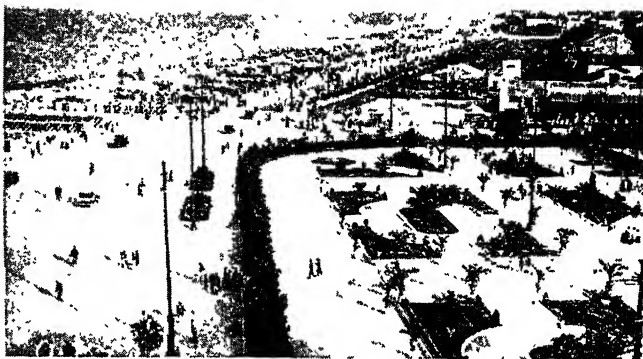
the Allied command, to Greek infantry supported by New Zealand armour.

The capture of Rimini turned the Gothic line in the E., but too late for the Allies to take full advantage of the victory: torrential rains set in, putting an end to major operations until the next spring, and the confident Allied expectation that the Germans could be driven out of Italy by the end of 1944 thus became impossible of fulfilment.

Rimmon Syrian deity worshipped at Damascus. His temple, the house of Rimmon (2 Kings 5, v. 18), probably containing the altar which Ahaz reproduced at Jerusalem (2 Kings 16), probably lies beneath the Great Mosque. Alternatively called Hadad, he is identifiable with the Babylonian thunder-god Ramman and with the corresponding Assyrian Adad.

Rimouski. Town of Quebec, Canada. The point where mail steamers take on a St. Lawrence pilot, it is 180 m. E. of Quebec on the C.N.R. The seat of an agricultural college, it has saw mills, peat mining, and a cod liver oil refining plant. A third of the populace lost their homes in a fire, May, 1950. Pop. 7,009.

Rimsky-Korsakov, NICHOLAS ANDREVICH (1844-1908). Russian composer. Born at Tikhvin, Novgorod, March 18, 1844, he began his musical education at 6 and soon was making attempts at composition. He entered the naval college at St. Petersburg in 1856. Friendship with Balakirev and his associates in the 1860s was a great influence in his career. During a cruise, 1862-65, he composed his first symphony, which Balakirev conducted. Retiring to devote himself to music, Rimsky-Kor-



Rimini. An air view of the sea front and bathing beach at this Adriatic port. Top, bridge across the Marecchia built by the Emperor Augustus: it was shaken by blast during the Second Great War

tive power his music ranks high, though lacking the depth of feeling and creative power of the greatest composers, and the brilliant scoring and melodic invention of his work made it popular. His chief operas are *The Snow Maiden*, 1880; *Tsar Saltana*, 1900; *Le Coq d'Or*, 1910. In orchestral composition he showed a preference for programme pieces, e.g. *Antar*, and the symphonic suite *Shéhérazade*. His autobiography was translated into English as *History of My Musical Life; consult also Life by Stassov*, 1890; and *History of Russian Music*, M. Nathan, 1915.

Rinderpest (Ger., cattle plague). Highly contagious and fatal disease of cattle and other ruminating animals. It is indigenous in India, China, Russia, Tibet, and other parts of Asia, but has not been found in the U.K. since 1877. A serious outbreak occurred there in 1865, when the damage to agriculture was estimated at £5,000,000 from the loss of cattle alone.

may even be carried by the air, but the range of infection by air is not great. Infected bodies buried in the ground remain virulent for months, and even freezing does not destroy the activity of the germ. There is no cure known, but in places where it is common animals which recover become immune. Where it is rare, the disease is almost invariably fatal in from four to seven days. Arsenical preparations have been tried as a remedy, and immunisation by a vaccine has been attempted. See Cattle.

Ring (A.S. *hring*, circle). Circular band, usually of metal, worn on the hand. Great importance has always been attached to rings, which have been in use since remote times. Signet-rings are among the most ancient, bearing carved or incised symbols peculiar to the owner, which gave an impression in wax or clay equivalent to a signature. It is of this type that we read in the Bible and ancient chronicles, as being used as tokens



Ring. Examples of finger-rings. 1. Etruscan; gold hoop with oval engraved stone. 2. Roman; gold octagonal hoop and garnet with intaglio. 3. Merovingian; gold set with garnets. 4. Scottish, 16th century; gold dated 1566 and engraved with the initials MH for Mary Queen of Scots and Henry Darnley, to whom it belonged. 5. French, 13th century; gold episcopal ring, with uncut sapphire. 6. English; gimmel ring set with jewels. This was the wedding-ring of Sir T. Gresham. 7. Italian, 16th century; gold set with jewels. 8. Anglo-Saxon; gold, probably an episcopal ring of Alhstan, bishop of Sherborne. 9. English, 18th century; gold signet engraved with coat of arms

2-5 and 7-9, by courtesy of the Director, Victoria & Albert Museum, S. Kensington

of authority. The Egyptians, who possessed independent seals, also wore signet-rings, many of which had pivoted bezels, one side engraved with the hieroglyphic cartouche or signature, the other carved into the shape of the sacred scarab beetle, or other religious symbol. Some of these were adorned with coloured enamels, coloured glass, or precious stones. Another practical form of this article was the bow-ring, worn on the thumb with a sloping part to protect the ball of the thumb from the rebound of the bow string.

Early types of rings were made in the shape of three part circles, the ends fitting into the bezel, or with small end rings to hold the pivoted bezel. Others are plain bands, flat or rounded. In the more elaborated types we have the hoops of varied styles attached to the flattened front part, the bezel or chaton, also called a collect when encircling a cameo or a precious stone. Twin (gimmel) rings, consisting of two circlets interlocked, as well as trick rings consisting of two, three, or more separate circlets which joined up when placed on the finger, but fell apart when taken off, are found among ancient jewelry.

Use in Classic Times

In early days Greeks made little use of rings. In republican Rome rings were plain; the equestrian order wore them made of iron, but these later became tokens of the servile state. Under the emperors great extravagance was displayed in the matter of rings, both men and women wearing superb specimens enriched with carving, chasing, enamelling, cameos, intaglios, and precious stones. Some of the most beautiful were hollow, to contain poison, either for an enemy or

for self-destruction. Such rings persisted until the 18th century. Charm rings were in use among the Romans, as they had been with the Egyptians, and later with the Coptic and other Gnostics. In medieval times and long after, charm and magic rings were in high esteem, bearing mystic inscriptions and symbols. The precious stones themselves were deemed to be charms, each having a special attribute as a preservative against poisoning, the evil eye, casting of spells, and so on.

Betrothal and Marriage Rings

In ancient Rome a ring was given as a pledge of betrothal, and though this custom seems to have been the origin of the modern wedding-ring, it may still be traced in the common practice of giving a gem-ring when a marriage engagement is agreed upon. Another form of betrothal ring, common in Elizabethan and Stuart times, was the posy or posy ring, the name being derived from the rhyming inscription cut upon it. Similar appeals for faithful love were once conveyed by rings given on the occasion of marriage.

Marriage rings were adopted by the Church from the pagan custom of placing a ring on the bride's finger, no doubt originally as a symbol of possession. Wedding-rings have nearly always retained the plain circle form of the old iron hoops. But it was otherwise with the Jews. Their marriage rings are heavy, elaborately carved, broad bands with inscriptions, and frequently possessing projecting bezels in the shape of miniature tabernacles. Certain of the ecclesiastical rings of office, bestowed on bishops, mitred abbots, cardinals, and popes, have this peculiarity of enormously projecting bezels.

Many of them are of such dimensions that they can have been used only on ceremonial occasions over gloves.

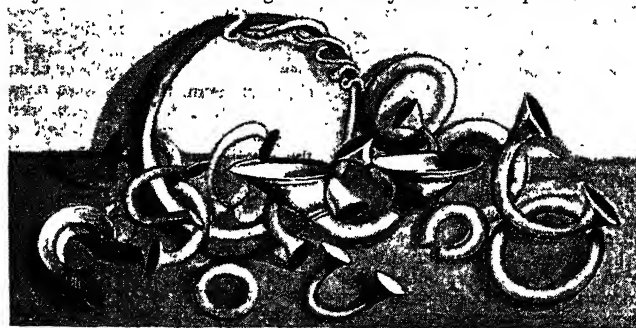
In the papal rings broad hoops support heavy projecting bezels, the shoulders and side adorned with sacred figures, symbols and heraldic shields, in the top a table or cabochon cut gem, the flat ones occasionally incised. The gems were usually sapphires, the token of purity, though rubies (fiery glory), emeralds (tranquillity), and crystal (simplicity) are also seen. This symbolism of the above value of stones has come down to us in the natal stones, a special gem being assigned to each month, and alphabet rings, one stone or a variety being chosen to give the initial letter, or even to spell a name in full. A ring, the "marriage ring of England," is used in the coronation ceremony, and formerly contained a fine sapphire, said to have belonged to Edward the Confessor. The Doges of Venice wore rings of office, and these they cast into the Adriatic on Ascension Day of each year as a token of the marriage of the Republic to the Sea. (See Bucentaur.)

Devotional and Memorial

Devotional rings include those known as decade rings, the hoops adorned with ten knobs, for ten Aves, the bezel serving for the Paternoster. Others have hinged bezels, the gem stone concealing a sacred miniature, symbol, or inscription. Similar rings of secular nature have portraits or mottoes; among these may be classed the memorial rings for lost causes, the Stuart or Bourbon rings. Allied to these are the mourning rings; some having hair of the deceased daintily plaited or formed into conventional designs, placed under crystals or white sapphires; others are enamelled black, and bear portraits, appropriate emblems, or inscriptions. Attachments to rings are not uncommon. Some Roman rings had small keys projecting from the hoop flat against the finger: probably keys of treasure chests. In later times we see gems, miniature reliquaries, or charms,

pendant on chains from rings. Rings have been worn on all the digits, including the thumb, which was much favoured among Asiatics and in Europe, especially in the 15th and 16th centuries. Ecclesiastical rings were early worn on the first finger of the right hand, then on the third of the left, the marriage finger, because it is supposed to communicate direct to the heart by an artery. The little finger of the right hand was chosen for the signet ring. The British museum contains a fine collection of rings.

In occult and magical ceremonies, the use of the ring is of very ancient date and its origin is



Ring Money. Examples of this ancient metallic currency, found in Ireland

obscure. There is a suggestion that it was an emblem of the sun, but more probably it represented the idea of binding or constriction. The necromancer stood within a ring drawn on the ground during his incantation, with the idea that he was thus enclosed against the assaults of evil spirits, who were unable to cross the boundary of the ring. Many of the earliest temples and meeting-places were built in the form of a circle. See Circle; Jewelry; Memento Mori; Nose-ornament; Precious Stones; Symbolism.

G. C. Rothery

Bibliography. Antique Rings and Gems, C. W. King, 1872; Finger Ring Lore, W. Jones, 1877; Rings for the Finger, G. F. King, 1917.

Ring and the Book, THE. Blank verse poem by Robert Browning, first published in 1868-69 in four volumes. The subject is that of a 17th century murder trial, as the result of which Count Guido Franceschini and four accomplices were executed in Rome, in 1698, for the murder of the child-wife of the count and of her putative parents. Having picked up in Florence an old volume in which the record of the trial was presented, the poet determined on the form of his work,

which in its successive books gives the case from different points of view, with extraordinary psychological insight.

Ring Bolt. Bolt with a hole through the head through which a loose ring is passed. Ring bolts are largely used for embedding in masonry or bolting into timber wharves and similar structures for mooring boats.

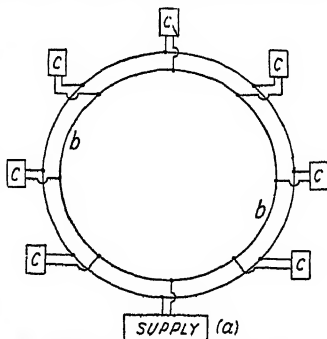
Ringbone. Disease of horses, a cause of lameness. It results from inflammation of the periosteal covering of the bone below the fetlock. It is usually set up by a blow, a kick, or some similar accidental cause. The seat of the disease is usually the short pastern bone



Ring Dove. The common wood pigeon, with white patch on neck largest member of the tribe in Great Britain, it is so named from the patch of white on either side of the neck, and occurs throughout the country and is common in the London parks and squares. It is a voracious eater, and a serious pest to the farmer. See Pigeon.

Ringkjøbing OR SLAVNING FJORD. Large lagoon in W. Jutland, Denmark. It is 28 m. long and has a width of 9 m. At its head is the little town of Ringkjøbing, with a pop. of some 3,000.

Ring Main. In electricity, a cable arranged in the form of a ring or loop as distinct from a



Ring Main. Diagram illustrating a method of current transmission, to several points, in electricity. a. Source of electricity. b. Ring main. c. Points of use

single open-ended length of cable. Such an arrangement permits the use of a conductor of smaller cross-sectional area to supply electricity to a number of points, as the electric current to reach its destination can traverse two paths which are virtually in parallel.

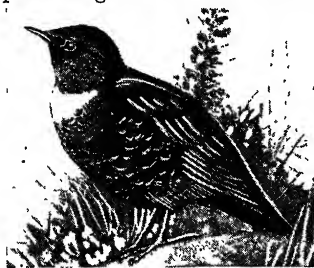
Ring Money. Primitive form of metallic currency used in ancient Egypt, Gaul, Ireland, Norway, etc., and still used in some parts of Africa. It arose from and is often indistinguishable from golden articles of adornment worn by barbaric peoples. Probably it came into use among savage people as a result of the custom of wearing all their wealth in the form of ornaments. In Egypt, ring money circulated by weight, and much of the ring money later used in Africa was of Birmingham manufacture. Many examples of ring money have been found in the British Isles. See Coinage; Numismatics; consult Origin of Metallic Currency, W. Ridgeway, 1892.

Ringnes. Two islands in the Arctic Ocean, British N. America. They are situated between Axel Heiberg Land and Melville Island. The E. island is called Amund Ringnes, while that to the W. is Ellef Ringnes.

Ring of the Nibelung, THE. Sequence of four music dramas by Wagner. The plays were written in the inverse order of their natural sequence. Wagner's orig-

inal idea was to write one drama called Siegfried's Death, founded on an episode from the legendary German epic, the Nibelungenlied. He found that the story demanded so much explanation that he would have to write another opera as prelude to it, and that led to others. Begun in 1848, the poem was finished in 1852. The tetralogy comprises: Das Rheingold, first performed at Munich, Sept. 22, 1869; Die Walküre, Munich, June 25, 1870; Siegfried and Götterdämmerung, the concluding dramas, produced at Baireuth, Aug. 16-17, 1876, on the occasion of the opening of the festival theatre, when the whole cycle was first performed. Apart from certain lingering conventions, The Ring broke away from all traditional systems; it was owing to the demands made by this great work that Wagner planned his own theatre, which led to the building of the opera-house at Baireuth.

Ring-Ouzel (*Turdus torquatus*) OR MOUNTAIN BLACKBIRD. European song-bird of the thrush



Ring-Ouzel or Mountain Blackbird, a European song-bird

family. Its feathers are black with a narrow edging of greyish white, and it has a white patch on the throat. It arrives in England in April and breeds in a few districts in Devon, Derbyshire, and the N., nesting often in a tuft of heather. It is common throughout the mountainous regions of central Europe and Scandinavia. See Bird; Thrush.

Ring Snake. Alternative name for the common Grass Snake (*g.v.*).

Ringwood. Market town of Hants, England. It stands on the Avon, 24 m. S.W. of Southampton and 103 m. from London, with a rly.

station. At the end of the New Forest, it is a tourist centre and is noted for its beer. The chief building is the church of SS. Peter and Paul, largely rebuilt in the 19th century. In the High Street is Monmouth House, where the duke of Monmouth was brought as a fugitive after Sedgemoor. Ringwood is said to have been founded by the Romans as a military post. Market day, Wed. Pop. est. 5,000.

Ringworm OR **TINEA**. Affection of the skin due to the growth of a fungus, several forms of which are recognized. The common ringworm of Great Britain is most often seen in children between the ages of 5 and 15. It occurs most frequently on the scalp, starting as a small, scaly spot, which gradually enlarges and becomes almost denuded of hair. The disease may last for years if not treated. Various ointments may be applied, but by far the best treatment is the application of X-rays. Ringworm is contagious, and children suffering from it should be isolated.

Rintelen, FRANZ VON KLEIST (1883-1949). German spy. Commissioned in the navy in 1903, he was on the naval war staff in Berlin at the outbreak of the First Great War. Early in 1915 he was sent to the U.S.A. to sabotage armament cargoes. Returning to Germany on the Holland-America liner Noordam, he was taken off by the British naval intelligence and interned at Donington. After America's entry into the war, he was extradited to the U.S.A. and tried, being sentenced to four years' imprisonment. He returned to Germany, but lived from 1926 in England, where he was interned as an enemy alien 1940-45. He died in London, May 30, 1949. In 1933 he published *The Dark Invader*, about his espionage.

Rinuccini, GIOVANNI BATTISTA (1592-1653). Italian prelate. He was born in Rome, Sept. 15,

1592, and after considerable study entered the Church. He soon obtained promotion: Gregory XV made him his chamberlain, and in 1625 he was elected archbishop of Fermo. In 1645 Innocent X sent him to Ireland, where he took part in the intrigues of the Civil War. Ormonde, the royalist leader, signed a treaty with the English parliamentarians, but, influenced by Rinuccini, many Roman Catholics refused to accept it, and warfare continued. The plans of the papal envoy, however, did not succeed, and in 1649 he returned to Italy. He died Dec. 5, 1653.

Riobamba OR **BOLIVAR**. City of Ecuador, capital of the prov. of Chimborazo. It stands near the Riobamba river, 150 m. N.E. of Guayaquil on the rly. between that town and Quito, and is the headquarters of that rly. Situated near the extinct volcano Chimborazo, at an alt. of 9,100 ft., it has a ruined Inca palace, a cathedral, a seminary, and national college. The manufactures are carpets, cotton and woollen goods, butter and cheese, and footwear. One of the most ancient and historic towns of the republic, Riobamba was destroyed by an earthquake in 1797, and was entirely rebuilt on a new site 3 m. away. Pop. est. 19,500.

Rio Cuarto. Town of Argentina, in the prov. of Córdoba. It stands on the Rio Cuarto, on the Trans-Andean rly., 360 m. W.N.W. of Buenos Aires. A garrison town, it has an arsenal, and is of military importance. The centre of a fruit-growing region, it is a market also for stock reared in the district. Pop. est. 40,000.

Rio de Janeiro. State of Brazil, bounded on the S. and E. by the Atlantic Ocean. Mountainous in the interior, the surface slopes towards the coast. The Serra do Mar and the Organ Mts. are the dominating ranges. The state is watered by the Parahyba and smaller rivers, and is served by several rlys. On the coast the heat is oppressive, and malarial fevers prevail. The chief products are coffee, sugar, cacao, rice, maize, fruit, manganese, and indigo. The forests of the interior yield valuable woods; coal deposits are known; and half the steel needed in Brazil is produced in this state. The capital is Niteroy. Area, 26,627 sq. m. Pop. est. 2,070,662.

Rio de Janeiro (São Sebastião do Rio de Janeiro). Federal capital of the United States of Brazil. It lies on the W. shore just inside the entrance of the bay of Guanabara



Ringwood, Hants. Market Place and Town Hall

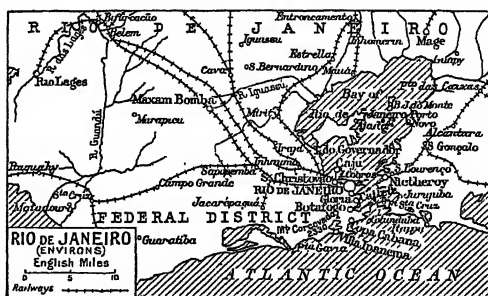
(commonly known as the bay of Rio de Janeiro). The name commemorates its discovery on Jan. 1, 1502. There is, however, no river of that name, the bay being a wide lagoon fed by small streams from the surrounding mountains. At its entrance, which is overshadowed by the famous Sugar Loaf Mt., the channel is less than a mile wide; but at its widest points the bay is 20–30 m. across. One of the world's finest natural harbours, it is an outstanding port of call.

The second city in importance and population of S. America, ranking next to Buenos Aires, it is situated in the S.E. corner of the federal district, which has an area of 431 sq. m. The old city, now the business centre, lies between the spurs of the surrounding mountains. It was formerly very insanitary, but drainage improvements have made it at least as healthy as most places in the tropics, with a death rate of 20 per 1,000.

About 1905, when Passos was prefect of the federal district, improvements were made in the construction of the city. Narrow streets were pulled down, and in their place wide avenidas were constructed. Notable among these was the Avenida Central, now

Avenida Rio Branco (after the famous minister for foreign affairs), which is the main artery of the city. Lined with splendid modern buildings, it is continued along the shore of the bay, past the residential suburbs of Botafogo and Gloria, by the Avenida Beira Mar, which is constructed with a sea-wall of granite and laid out in gardens and walks to an extent of 4 m.

Rio de Janeiro has many fine ancient buildings, *e.g.* the Candelaria church, while the Monroe palace, national library, and national museum are excellent specimens of modern architecture. The national telegraph office, which was formerly the royal palace, is a notable edifice. The Carioca aqueduct, in which the water of Rio is brought, extends from the mountains of Santa Thereza to those of Santo Antonio, and has been described as the only fine specimen of architecture left by the Portuguese in Brazil: it



Rio de Janeiro. Map of the environs of the city, showing the area administered as the Federal District

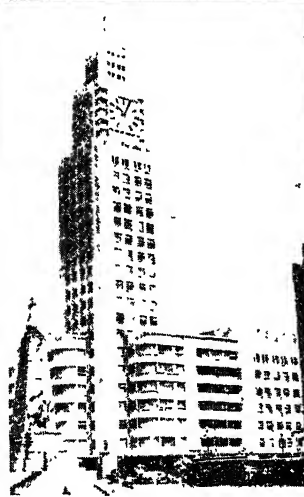
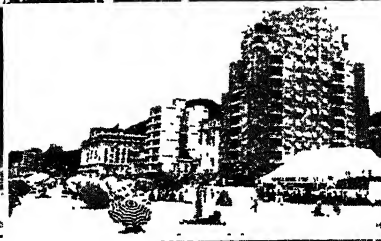
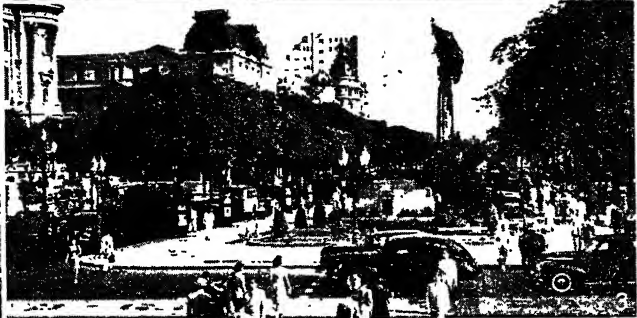
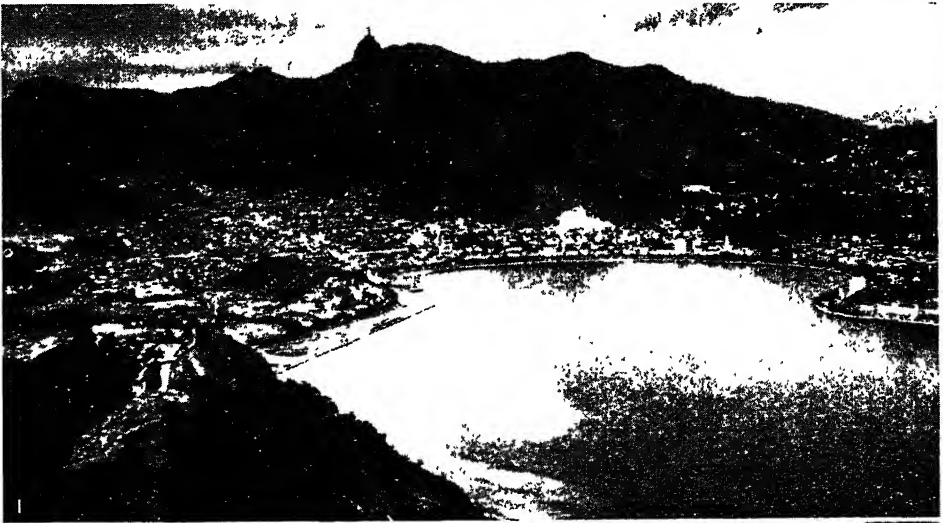
was completed in 1750. The hospital, Santa Casa da Misericórdia, is one of the largest institutions in the world. There are schools of medicine and law, a polytechnic school, conservatory of music, and various academies for art, science and commerce. The exchange and government offices are imposing structures. Many of the modern buildings are palatial, and the city squares with statuary, fountains, and luxuriant greenery are strikingly beautiful. The earth washed down from the Moro do Castelo now forms the peninsula of Ponto do Calabouço, on which the great airport of Santos Dumont has been built.

Extensive harbours have been constructed. The Central Brazilian rly. leads to São Paulo, Santos, and the S., the Ncopoloma rly. to Petropolis, Victoria, and the N. The principal export is coffee; imports are cereals, coal, and manufactured goods. It is estimated that the population of the Federal District, which is administratively co-extensive with Rio, is about 2,000,000. Trade winds cool the air, and the maximum temp., 90°, is in Feb., the minimum, 60°, in July.

Rio de Janeiro was discovered by the Portuguese and Italian navigators Gonçalves and Vespucci in 1502. A settlement was made there in 1504 by Coelho, a follower of Gonçalves, but it was destroyed by the Tamoyo Indians soon afterwards. In 1555 a French nobleman, Villegaignon, established a settlement at Rio on the mainland and the island of his name, but it was taken by the Portuguese governor, Mem de Sá, in 1568, who then established the town of São Sebastião do Rio de Janeiro on the Morro do Castelo. The town was bombarded by the French admiral, Duguay-Trouin, in 1711. Rio de Janeiro took the place of Bahia as capital of Brazil in 1762, and became the capital of



Rio de Janeiro. Plan of the central districts of the capital city of the United States of Brazil



1. The city and Botafogo Bay viewed from the Sugar Loaf Mt. In the distance is the peak of Corcovado. 2. The National Library. 3. Praça Floriano (Floriano Square). 4. The Central railway station. 5. The Avenida Rio Branco. 6. Copacabana beach. 7. The Parque do

Paris, on the Avenida Beira Mar, or "Edge of the Sea." 8. The huge statue of Christ which crowns Corcovado, or Hunchback Mountain, 2,329 ft. above the city. The figure, made of concrete, is 110 ft. high. It is floodlit at night and is reached by a rack railway

RIO DE JANEIRO: SCENES IN THE CAPITAL OF THE UNITED STATES OF BRAZIL

the empire of Brazil in 1822. In 1889, after the proclamation of the republic, it was made, with the surrounding territory, federal district and federal capital of the republic. It is governed by a prefect appointed by the government and assisted by a mun. council.

Rio de Janeiro. TREATY OF. Official name of the treaty of mutual defence signed by the states of the American continent, Sept. 2, 1947, at Petropolis (*q.v.*), near Rio de Janeiro.

Rio de Oro (Sp., river of gold). Spanish colony along the coast of W. Africa, S. of Morocco. The country is mainly desert, and forms a W. extension of the Sahara, and the climate is exceedingly hot. Villa Cisneros is the capital. Its area is 73,000 sq. m. Pop. est. 30,000, much increased after the rainy season, when some 30,000 nomads enter the territory with their flocks.

Rio Grande. Name of two rivers of Brazil. One rises in the mts. on the W. border of Bahia state, flows N.E., and joins the São Francisco at Barra. From the N. it receives several affluents. Its length is about 300 m., and it is navigable for 130 m. The other rises in the Serra de Mantiqueira in the S. portion of the state of Minas Geraes, flows along the frontier of Minas Geraes and São Paulo, and unites with the Paranahyba to form the Paraná after a course of about 440 m.

Rio Grande. River of U.S.A., known along parts of its course as Rio Grande del Norte or Rio Bravo del Norte. It rises in the San Juan Mt., S.W. Colorado, and flows S. and S.E., separating Texas from Mexico, to the Gulf of Mexico. About 2,200 m. long, the river may be considered in three parts: near its source it is a swift mountain torrent; it soon changes to the chief source of the irrigation of interior deserts; near its mouth it is a sluggish river of the Texas coastal plain. A dispute with Mexico over the abstraction of its waters resulted in a gigantic storage dam at Engle, New Mexico, from which 60,000 cubic ft. have been since 1907 diverted annually to Mexico for irrigation purposes. The biggest city on its course is El Paso, Texas, where the Rio Grande is almost dry for a large part of the year.

Rio Grande do Norte. State in N.E. Brazil. It lies between Ceará and Parahyba, sloping N. and N.E. to the Atlantic. It is for the most part mountainous

and not well watered, but there is a level tract near the coast. The climate is hot and dry, and, on the whole, equable and healthful. It produces cotton, cattle, sugar, various kinds of valuable timber, cochineal, coffee, wax, rubber, tobacco, drugs, salt, and fish. The capital is Natal. Its area is 22,189 sq. m. Pop. 774,503.

Rio Grande do Sul. Southernmost state of Brazil. Bounded on the N.W. by Argentina and on the S.W. by Uruguay, its coasts on the Atlantic Ocean are low and almost filled with lagoons (*see* Lagoa dos Patos). Largely grass land, the chief occupation is the rearing of cattle, horses, and mules. Vines, rice, tobacco, coffee, vegetables, maté, sugar, and cereals are cultivated, and linen, woollens, and soap are manufactured. Wolfram is mined, and copper, gold, amethysts, agates, and coal are found. The capital is Porto Alegre (*q.v.*). Its area is 112,278 sq. m. Pop. 3,336,632.

Rio Grande do Sul. The fifth seaport of Brazil, and the most S. for seagoing steamers. It is in the state of Rio Grande do Sul. It stands at the mouth of the Lagoa dos Patos, and is connected by rly. with Pelotas and the interior, and with Porto Alegre by steamer. Low-lying, on a sandy plain, it has a large harbour, and exports dried meats, hides, hair, tobacco, maté, etc. Tanning and brewing are important industries and one meat packing plant disposes of 2,000 head of cattle per day. Pop. est. 65,000.

Rioja. Spanish wine produced in La Rioja (*q.v.*) dist., Old Castile. A fine, red wine of a heavy, claret type, it is characterised by full body, slight ferruginous flavour, fair alcoholic strength, purity, and cheapness. Exported from Bilbao, it is called Spanish Burgundy.

Riom. Town of France. In the dept. of Puy-de-Dôme, it stands on the left bank of the Ambène and is a junction of the Lyons rly., 8 m. N. of Clermont-Ferrand. The church of S. Chapelle, built 1382-38, was formerly the château of the dukes of Auvergne. The 15th century church of Notre-Dame-du-Marthuret has a fine Virgin with bird on the portal. There are tobacco and linen factories and a trade in corn, wines, etc. The town contains many fine 15th and 16th cent. houses. Pop. 12,975.

Here was staged, Feb. 20-April 2, 1942, the "war guilt" trial, organized by the Vichy govt., of Frenchmen prominent in the last years of the Third Republic.

A "supreme court" composed of well known French jurists, and charged with the duty "to seek out and to try all persons having committed crimes or offences or who failed in their duty in acts concerning the transition from a state of peace to a state of war," had been installed at Riom on Aug. 8, 1940. Those eventually brought to trial before it were Edouard Daladier, prime minister in Sept., 1939; Léon Blum, prime minister in 1936; Gen. Gamelin, Allied c.-in-c. at the beginning of the Second Great War; Guy la Chambre, a former air minister; Robert Jacomet, controller-gen. of armaments; and Pierre Cot, air minister under Blum. Cot, in the U.S.A., was tried in absence.

Hitler instigated the Riom trial in order to secure public admission by former holders of high office in France that their country was responsible for the outbreak of war. In fact, the reasons for France's military defeat were the only subject argued by the court, and the proceedings became an investigation into responsibility for France's unpreparedness for war; and in a speech to the Reichstag on March 15 Hitler expressed his displeasure with the conduct of the trial.

The court was adjourned April 2, suspended April 14, dissolved June 13. The defendants, other than Cot, had been in custody or under surveillance since 1940; they were kept in prison, neither acquitted nor condemned, first in France, then, after the Allied invasion of N. Africa, in Germany until liberated by the Allies in 1945.

Rio Muni. Alternative name for Spanish Guinea (*q.v.*).

Rion. River of Transcaucasia, the ancient Phasis. Rising on the S. slope of the main Caucasus range, it falls into the Black Sea at Poti, after a course of 200 m. It was famous in antiquity from its connexion with the Argonautic expedition. *See* Georgia.

Rio Negro. Territory of Argentina, in Patagonia. Stretching from the Andes to the Atlantic, where it is indented by the Gulf of San Matias, it is bounded on the N. by the Rio Colorado and S. by Chubut Territory. It is traversed by the Rio Negro and the rly. from Bahia Blanca to Neuquen. The territory is mostly plateau, with a dry and healthful climate, and the soil is fertile when irrigated. It produces cereals and alfalfa, and raises large quantities of stock. The capital is Viedma, situated on the Rio Negro near

the coast. Area 77,610 sq. m. Pop. 42,242.

Rio Negro. Department of W. Uruguay. It is bounded on the W. by the river Uruguay and S. by the Rio Negro. The principal occupations are agriculture and stockraising. The capital is Fray Bentos (*q.v.*). Area 3,269 sq. m. Pop. 47,586.

Rios, JUAN ANTONIO (1888–1946). Chilean statesman. Born at Cañete, Arauco province, Nov. 10, 1888, he studied at Lebu and Concepción, and became a lawyer. Entering politics as a Radical, he was appointed Chilean chargé d'affaires and consul-general in Panama in 1921, and two years later took up a parliamentary career, becoming minister of the Interior in Dávila's government, 1932, and later minister of Justice. He was elected president of Chile in 1942. His handling of foreign policy was particularly skilled at the time when his country broke off diplomatic relations with the Axis countries, declared war on them, and joined the United Nations. He died June 27, 1946.

Riot (M.E. *riote*; cf. Ital. *riotta*, quarrel). Term used broadly for revelry, tumult, or disorderly proceedings. In English law, a riot is defined as a violent disturbance of the peace by not less than three persons, who, having gathered together without lawful authority, and having agreed among themselves to withstand opposition, execute or begin to execute a common purpose turbulently to the terror of the people or of at least one person of reasonable firmness and courage.

Any citizen may be called upon to help in suppressing a riot. Under the Riot Damages Act, 1886, the local police authorities may be sued for damage done during the riot. See Sedition.

Riot Act. Act passed in 1715, which gives power to magistrates to apprehend, as felons, persons who to the number of 12 or more assembled refuse to disperse within an hour after the reading of proclamation bidding them to do so. The Act, further, indemnifies any who at the request of the magistrate assist him in carrying out the law. This indemnification in effect gives magistrates power to employ military to disperse a mob. The Act was originally prompted by fears of Jacobite risings.

Rio Tinto, MINAS DE (Sp., coloured river mines). Town of Spain, in the prov. of Huelva. The name "Tinto" derives from the discoloration of the river's

waters by copper ore. It stands near the source of the river Tinto, 52 m. by rly. N. of Huelva. The centre of one of the most celebrated copper-mining regions of the world, Rio Tinto and the surrounding villages are peopled by some 10,000 miners. The mines, known to the Carthaginians, and worked by the Romans, yield over a million tons yearly of iron pyrites containing copper and sulphur.

Riparian Owner (Lat. *ripa*, bank). In law, one whose land is



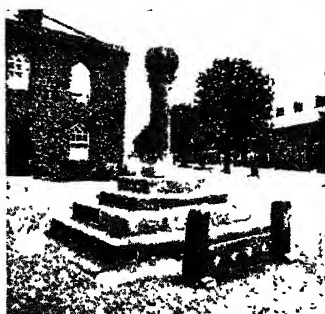
Ripley, Yorkshire. Castle, built in the 16th century, where Cromwell stayed before the battle of Marston Moor. Top, Ripley Cross and stocks

part of the bank of a stream or river. In a non-tidal river, or in a tidal river above the limit to which the tide reaches, as a rule the bed of the river belongs to the riparian owner as far as the middle. This constitutes the riparian owners, in effect, the owners of a river or stream, and the public have, as a rule, no rights of navigation, or of fishing, or bathing.

Rip Cord. Device on a manually-operated parachute for releasing the silk canopy from its retaining pack. It consists of a length of cord having at its free end a metal ring or handle. When the cord is pulled the locking pins holding the flap of the canopy are withdrawn, and the springs pressing the canopy against the flap are released, forcing it out of the pack. See Parachute.

Ripley. Urban dist. and market town of Derbyshire, England. It is 10 m. N. of Derby. All Saints church is a modern building. There are some textile manufactures and around are coal mines and ironworks. Ripley was made a market town in the 13th century. Market day, Sat. Pop. 17,750.

Ripley. Village of Surrey, England. It is 5 m. S.E. of Woking. Being on the main road from London to Portsmouth, several miles of which are sometimes called the Ripley Road, it was an important place in coaching days.



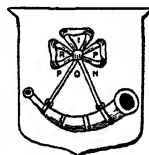
Ripley. Small, but historic, village of the W. Riding of Yorks, England. On the Nidd, 3 m. N. of Harrogate, it has a fine church, dedicated to All Saints, in which are memorials to the Ingilby family. Ripley Castle dates from the 16th century, but has been modernised. Cromwell

stayed here before the battle of Marston Moor. Pop. 221.

Ripon. City and mun. borough of the W. Riding of Yorkshire, England. On the Ure, it is 26 m. N.

of Leeds, and is served by rly. Ripon cathedral replaced an earlier one, of which the crypt remains. Its erection occupied about three centuries, and consequently it displays all styles of architecture, from the Norman apse through the Transitional transepts to the Perpendicular work in the choir and elsewhere. It was restored by Scott in 1862-72. The chapel of the hospital of S. Mary Magdalen is a Norman building. The city has some old almshouses, including the hospitals of S. John the Baptist and S. Anne; an 18th century town hall; a grammar school; and two museums. The episcopal palace is just outside the town. There is a lofty obelisk in the market place. Ripon is a spa. It trades in agricultural produce and manufactures leather goods. Near are Studley Royal (*q.v.*) and Fountains Abbey (*q.v.*).

Ripon grew up around an abbey founded in the 7th century. S. Wilfrid, to whom the cathedral is dedicated, being the first abbot. It was soon made a corporate town,



Ripon arms



Ripon, Yorkshire. The cathedral viewed from the south-east

and had fairs and markets which until 1880 belonged to the archbishop of York or the ecclesiastical commissioners. It became famous for cloth, and later for the quality of its spurs. The chief official was known until 1604 as the wakeman, and a horn is still blown in the market square every evening at 9 p.m. Ripon was made the seat of a bishop in 1836, the cathedral having been a collegiate church. It had an M.P. until 1885, and now gives its name to a co. constituency. The treaty of Ripon was signed here between Charles I and the Scots in 1640. Pop. 9,177.

Ripon, FREDERICK JOHN ROBINSON, 1ST EARL OF (1782-1859). British statesman. Born in London, Oct. 30,



1st Earl of Ripon, British statesman

1782, the second son of the Baron Grantham, he was educated at Harrow and St. John's College, Cambridge. Becoming M.P. for Carlisle in 1806, he represented Ripon 1807-27. He was president of the board of trade, 1818-23; chancellor of the exchequer, 1823-27, in which capacity he was nicknamed by Cobbett "Prosperity Robinson"; secretary for the colonies; then he was made Viscount Goderich and succeeded Canning as prime minister for a few months in 1827-28. Again he was secretary for the colonies, 1830-33; lord privy seal, 1833-34; president of the board of control for India, 1843-46. Created earl in 1833, he died Jan. 28, 1859.

Ripon, GEORGE FREDERICK SAMUEL ROBINSON, 1ST MARQUESS OF (1827-1909). British statesman. Born Oct. 24, 1827, when his father, Viscount Goderich, later earl of Ripon, was prime minister,

he was educated privately. Early liberal opinions were deepened by his friendship with Kingsley, Hughes, and other Christian Socialists. In 1852 he entered parliament as M.P. for Hull, and he held other Yorkshire seats until 1859, when he succeeded his father as earl of Ripon and his uncle as Earl de Grey. That year he became under-secretary for war.

In 1863 he entered the Liberal cabinet as secretary for war, and from that time was one of the leaders of his party. In 1866 he was secretary for India, and in 1868 Gladstone made him lord president of the council. He was chairman of the commission appointed to settle the Alabama dispute, and was created a marquess in 1871, but resigned his cabinet office suddenly in 1873. Though he had become a Roman Catholic, Ripon's next important post was that of governor-general of India, 1880-84, a difficult time owing to troubles in Afghanistan. In 1886 he was first lord of the



Ripon

admiralty; during 1892-95 secretary for the colonies; and during 1905-08 lord privy seal and Liberal leader in the lords. He died at Studley Royal (*q.v.*), July 9, 1909. His son, Frederick (1852-1923), long known as Earl de Grey, succeeded him, and on his death the title became extinct.

Ripon Falls. Falls on the river Nile discovered by Speke on July 28, 1862. The three distinct falls, near where the Nile issues from Victoria Nyanza, prevented navigation, but a rly. was built, 1912-13, from Jinja to Namasagali (61 m.) to afford communication with Lake Choga (Kioga). Under the Owen Falls Dam (*q.v.*) scheme, Ripon Falls were to disappear.

Ripperda, JOHANN WILHELM, DUKE OF (1680-1737). Dutch adventurer. Born at Groningen, he entered the service of Philip V of Spain in 1715, and was rewarded for his success in negotiating the alliance of 1725 with Austria by a dukedom. On his disgrace in 1726 he escaped to Holland, and then to Morocco, and induced the sultan Muley Abdallah to attack Spanish territory in Africa. The expedition which he commanded under the name of Osman Pasha failed, and he died at Tetuan, Nov. 2, 1737.

Ripple Mark. Name given to the small-scale undulatory patterns seen on sands. Ripple marks are caused by the movement of water or air, and can result from oscillatory motion or wave action which gives symmetrical ripples, or from current action which produces asymmetrical ripples. In rivers the type of ripple mark formed depends on the velocity of the current.

Rip van Winkle. Hero of a story in Washington Irving's *The Sketch Book*, 1819-20. Inhabitant of a village in the Catskill Mts., N.Y., he falls into a 20 years' sleep, and wakes to find everything changed and himself wellnigh forgotten. The story was long popular



Ripon Falls, Central Africa. The first of the three falls in the Nile where it issues from Victoria Nyanza

in the form of a drama, first performed in 1828. There have been several revivals, including Boucicault's version, with Jefferson in the title-rôle (Adelphi, 1865), an anonymous version with Tree in the part (Her Majesty's, 1900), and Austin Strong's with Cyril Maude as Rip (Playhouse, 1911). Farnie and Planquette produced a comic opera, with Fred Leslie as Rip, at the Comedy in 1882.

Risaldar. Commissioned officer in the Indian and Pakistan cavalry. He corresponds to the infantry subhadar, and may be promoted to risaldar major.

Risca. Urban dist. of Monmouthshire, England. It stands on the Ebbw, 6 m. N.W. of Newport, and has a rly. station. There are chemical and tinplate works, and coal mines near by. Pop. 14,500.

Risdon. Town of Tasmania. It stands on the Derwent estuary, in Monmouth co., opposite Hobart. Here is one of the largest zinc-producing plants in the world, covering 150 acres and employing 1,600. Some 55,000 h.p. of hydro-electric power is supplied for the production of 80,000 tons of zinc annually from concentrates and slimes, as well as cadmium, zinc sulphate, cobalt oxide, fertilisers.

Rise. Geographical term meaning an elevation, ridge, or plateau rising above the general level of the ocean floor. An excellent example of a rise is the long and irregular elevation which longitudinally traverses the whole length of the Atlantic Ocean, and divides it into two deep basins. In the N. Atlantic it is called the Dolphin Rise, in the S. Atlantic the Challenger Rise. The Azores, Ascension, and Tristan da Cunha stand upon the Atlantic rise. See Ocean.

Rise. In mining, name of a particular kind of shaft. Small shafts are excavated from one floor level of the mine to the one next above, and such a shaft is called a rise, as distinguished from a winze (*q.v.*). It may be vertical or inclined; its sides are timbered. A timber partition goes down the middle forming two compartments, one with ladders for the miners and the other for the removal of ore or waste. Larger rises are often divided into three compartments.

Rishi. In Oriental mythology, title given to the seven mind-born sons of Brahma, the seers or sages to whom were revealed the Vedas. The term is also applied to other ancient poets and men of special sanctity. In astronomy, the word was used of the stars forming the Great Bear.

Rising Sun. ORDER OF THE. Japanese order, also known as the Eastern or Morning Sun. It was instituted in 1875, with eight grades, as a reward for military and civil services. The badge is a red sun emitting 32 white rays, the ribbon white with red borders.

Risk (Fr. *risque*, peril). Possibility of loss, damage, or danger; (verb), to subject to risk; in insurance and commerce, the thing itself which is subjected to risk. Insurance is a means of spreading the risk and consequently the loss, should this occur. Risks compulsorily insured against under state insurance schemes in the U.K. include sickness, medical expenses, disablement, industrial injuries, unemployment, and burial expenses; in addition, users of motor vehicles must insure against the risk of damage to third parties. Other risks usually covered by insurance are damage by fire, tempest, etc.; loss by theft, burglary, etc.; loss or damage of goods in transit, particularly by sea. Insurance against bad weather is common when the whole success of the project depends on the weather (*e.g.* open-air entertainment). Lloyds (*q.v.*) will issue policies of insurance against contingencies of the most diverse kind; insurance companies generally are more specialized in the risks undertaken. See Insurance; Lloyds; Railways.

Rispetti (Ital. *rispettoso*, respectful). Originally, Tuscan folk songs conveying respectful salutations to the beloved one. The characteristic form is a verse of four lines rhyming alternately, followed by a rhyming couplet, called the *ripresa*, which develops some conception or fancy, or word or phrase, of the third or fourth line of the preceding quatrain. A variant form corresponds to the *ottava rima* of Italian literature, consisting of octaves composed of six lines alternately rhyming, followed by a rhyming couplet.

Ristich, JOVAN (1831-99). Serbian statesman. Born at Kragujevatz, Oct. 27, 1831, he entered the diplomatic service, and, as chief of the mission sent to Constantinople in 1860, succeeded in preventing a definite rupture with Turkey, and ultimately secured the withdrawal of the Turkish forces from Serbian

fortresses. He was a member of the council of regency during the minority of Prince (afterwards King) Milan, and for a brief period (1872-73) prime minister. Ristich was a partisan of Russian intervention on behalf of Serbian independence, while the prince in 1873 placed his hopes on Austria, and when Serbia had declared war on Turkey against Russian advice he became the recognized leader of the Liberal party, and was again called to power in 1876. In 1878 he represented Serbia at the Berlin congress. Ristich was a member of the council of regency during the minority of King Alexander I, and when the prince prematurely announced his majority by arresting his regents, Ristich retired. He died at Belgrade, Sept. 4, 1899.

Ristori, ADELAIDE (1822-1906). Italian actress. Born at Cividade del Friuli, Jan. 30, 1822, she achieved her first



Adelaide Ristori,
Italian actress
Elliott & Fry

triumph in Rome in 1849 as the heroine of Alfieri's *Myrrha*. In 1855 she was favourably received in Paris, where Rachel's supremacy seemed unquestioned, as *Myrrha*, *Francesca da Rimini*, and *Mary Stuart*, and was also seen in the *Medea* and *Beatrice* of *Legouvé*. She acted frequently in London, making her *début* as *Medea* at the Lyceum, June 4, 1856, and playing *Lady Macbeth* at Drury Lane, July 3, 1882. She died in Rome, Oct. 9, 1906.

Risus Sardonicus. Spasm of the facial muscles producing the appearance of a sardonic grin. It occurs in convulsive diseases and in poisoning by strychnine.

Rita. Pseudonym of Mrs. Desmond Humphreys (d. 1938). British novelist. Daughter of J. G. Gollan, she went from Inverness-shire to Australia as a child, and on her return to England published a novel before she was 20. She wrote some 60 stories, plays, and essays, and was for many years a best-seller, one of her early successes being *Souls*, an attack on the society of the time. She died Jan. 1, 1938



Rita,
British author

Ritardando OR **RITENUTO** (It., holding or held back). Musical terms of almost identical meaning, indicating that the time is to be slackened. The usual abbrev. is *rit.*

Ritchie, CHARLES THOMSON RITCHIE, 1ST BARON (1838-1906). British politician. Born at Dundee,



1st Baron Ritchie, British politician

Nov. 19, 1838, he was educated at the City of London School. In 1874 he became Conservative M.P. for the Tower Hamlets. In 1885 he was financial secretary to the Admiralty, and in 1886 he became president of the local government board, holding that position until 1892. M.P. for Croydon and president of the board of Trade in 1895, he later became Home secretary, and in 1902 chancellor of the exchequer. In his budget of 1903 he took off the existing duty of 1s. a quarter on corn; this gave offence to the tariff reformers, led by Joseph Chamberlain, who resigned, as also did Ritchie. In 1905 he was created Baron Ritchie of Dundee. He died Jan. 9, 1906. His elder son Charles (1866-1948), chairman of the P.L.A. from 1925 to 1941, was the 2nd baron, and was succeeded by his secondson (John) Kenneth (b. Sept. 22, 1902).

Ritchie, SIR NEIL METHUEN (b. 1897). British soldier. Born July 29, 1897, he was educated at Lancing and Sandhurst and commissioned in the Black Watch in 1914. He won the D.S.O. and M.C. during the First Great War. After 1918 he held various staff appointments in the U.K. and India, and in 1940 was promoted acting major-gen., in command of the 51st Highland div. After the Dunkirk evacuation he was created C.B.E., and early in 1941 was appointed deputy chief of staff, Middle East. On Nov. 26, 1941, he succeeded Gen. Sir Alan Cunningham in command of the 8th army in Libya. Following the fall of Tobruk on June 21, 1942, Ritchie prepared to fall back on Mersa Matruh, a decision that had been endorsed by the Middle East defence committee, but on June 25 Gen. Auchinleck took over personal control of the 8th army. Late in the year Ritchie was given command of the 52nd Lowland div., and in 1944 took command of 12 corps, B.L.A., which he led until the end of the war with Germany. He was G.O.C. Scottish

command and governor of Edinburgh castle, 1945-47, and C.-in-C. Far East land forces, 1947-49, then went to Washington as commander British army staff and mil. member of joint services mission. See N. Africa Campaigns.

Rite (Lat. *ritus*, custom). Religious act or ceremony; also used of the general body of services used by a church or group of churches, e.g. Byzantine Rite. In the R.C. Church, the congregation of rites regulates the general uniformity of practice in matters of divine worship. It also decides causes of beatification and canonisation. The congregation was established by Pope Sixtus V. See Liturgy.

Ritornello (It., a little return or repeat). A short strain of instrumental music. Originally it signified the music played between the scenes of an opera after the style of an intermezzo, but subsequently it meant the instrumental interludes in a song when the voice was silent. It is still used in connexion with an old form of Italian verse, composed of stanzas of three lines the first and the last rhyming.

Ritschl, ALBRECHT (1822-89). German theologian. Born in Berlin, March 25, 1822, he became professor extraordinary of theology at Bonn in 1852. In 1864 he took up a similar position at Göttingen, which he occupied for the rest of his life. Early he was influenced by



Albrecht Ritschl, German theologian

Baur, but the teachings of Lotze led him to modify his views. He belonged to the Neo-Kantian school of thought, which, in view of the generally materialistic attitude of German scientists, was disposed to regard the thing-in-itself as supplying a way of escape for those who sought a ground of faith beyond the bounds of human knowledge. He regarded such questions as the existence of God and the immortality of the soul as not being of the essence of theology, which should concern itself rather with the education of the soul in accordance with the teachings of the Bible. Ritschl, who wrote Theology and Metaphysics, 1887, died March 20, 1889. Consult Ritschlian Theology, A. E. Garvie, 1899; Ritschlianism, J. Orr, 1903.

Ritual (Lat. *ritus*, a rite). Name given to forms or ceremonies used in public worship. Ritual is found in every type of religion. It serves

two purposes: (1) to express the devotion of the worshippers towards the object of their worship; (2) to illustrate or convey the message or teaching of the God who is worshipped to the minds of the worshippers. Many forms are covered by ritual, e.g. an established order of prayer, singing hymns, vestments of clergy, etc.

Ritualism. System of conducting worship according to a ritual. The term has come to be used rather in a derogatory sense, of the High Church or Tractarian movement in the Church of England. The Oxford Movement led many clergymen to pay greater attention to ceremonial in worship, and altar lights, vestments, incense, etc., were introduced in many churches. These were authorised, it was urged, by the ornaments rubric of the Prayer Book, which prescribed the use of such ornaments as were in use in 1548, but many churchmen objected strongly to them, as savouring of Roman Catholicism, and in several cases legal proceedings were taken. The most famous was when Edward King, bishop of Lincoln, was put on his trial. A royal commission inquired into this subject in 1867, and in 1874 was passed the Public Worship Regulation Act, directed against ritualistic practices. In 1906 a commission on ecclesiastical discipline made further recommendations for checking excessive ritual. See Church of England; Lincoln Judgement; Oxford Movement; Pusey, E.B.

Riukiu, RYUKYU, OR LUCHU ISLANDS. Group belonging to Japan and extending in a festoon S. from Kyushu towards Formosa. Including the Sakishima islands, the group numbers 90 islands or islets with an area of 921 sq. m. Sugar cane and sweet potatoes are raised. The pop. may number half a million. Okinawa is the largest island, and the campaign of the Second Great War is described under that heading.

Riva. Town of Italy, in the Trentino. It occupies a picturesque situation at the base of the precipitous Rocchetta, 4,976 ft., on the N. shore of Lago di Garda, 10 m. W. of Roveredo. The Palazzo Pretorio, built by the Scaligers in 1370, is used as a law court; the reconstructed 12th century castle of La Rocca as a barracks.

Rivals, THE. Five-act comedy by Sheridan, produced at Covent Garden Theatre, Jan. 17, 1775. Badly received at first, it soon became a triumphant success, and remains among the most popular

of purely English comedies. In this first play, written when Sheridan was 23, the easy satirising of foibles of contemporary character marked his innate genius. The scenes are laid in Bath, and several characters have become familiar to all, *e.g.* Bob Acres, Lydia Languish, and Mrs. Malaprop. *The Rivals* marks the close of the period of sentimental comedy. In a revival at the Criterion Theatre, London, 1945, Edith Evans played Mrs. Malaprop. Birmingham repertory presented a version in modern dress, seen in London in 1948.

Rive-de-Gier. Town of France. In the dept. of Loire, it stands on the Gier and the Canal du Gier or de Givors, 13 m. N.E. of St. Étienne. It has coal, iron, steel, and glass works, and there are silk factories. Pop. 13,931.

River. Channel by which the rainfall on the land reaches the sea or basins of inland drainage. A river system or drainage area comprises the main river and its tributaries. The line bounding the drainage area is called the water divide or watershed.

Some rivers, especially those which flow through rainless areas and receive their water only from rains near their sources, are intermittent, and by excessive evaporation may cease to flow in their lower reaches. Most rivers have seasonal periods of flood, due either to heavy rainfall or to the melting of snows at their sources. Rivers in high altitudes freeze in winter, but an undercurrent generally remains in motion. When such rivers break up in spring there are heavy floods. In the N. hemisphere rivers flowing polewards are deflected by the rotation of the earth, and press against their E. banks; those flowing equatorwards press against their W. banks. The banks of a river are termed right and left, as one looks in the direction of flow. Drainage follows the natural slope

of the ground, and valleys nearly always are the work of the rivers. In regions of soluble rock rivers sometimes flow beneath the ground.

River systems are not fixed but steadily changing and developing. Rivers which follow the natural slope of the ground are termed consequent rivers; their tributaries, which cut valleys quickly along relatively soft strata, are subsequent rivers. Streams which flowed across a country before mountains were elevated, and where downward erosion has kept pace with the elevation, flow in gorges through mountain ranges; they are termed antecedent rivers. A river is always lengthening its course by eating backwards with source streams; in this way one river may capture another.

A typical river shows three characteristic portions: (1) the torrential course; (2) the valley course; (3) the plain track. In its torrential course it flows down the hillside in a narrow ravine as a mountain torrent much interrupted by falls. In the valley course the gradient is more gentle and the velocity of the stream less; the river is relatively easily deflected from its course by obstructions, and begins to wind or meander. Its destructive work is horizontal as well as vertical, the valley being widened by the destruction of the concave banks at the bends.

In its plain course the river has eroded downwards almost to sea level, and so has a gentle gradient and a low velocity. It meanders widely, but its work is mainly constructive in the formation of shoals, flood plains, and deltas. Many rivers have only a torrential course; in others the plain course has been drowned beneath the sea by depression of the land. In this event an estuary or firth is formed. In all its stages a river does transport work, but the amount of material that can be carried in suspension or rolled along the

bed depends on the velocity. A great deal of matter is also carried in solution.

The annual flow of the Mississippi carries to the sea about 400,000,000 tons of solid matter, and about 80,000,000 tons of dissolved mineral salts. It is estimated that the destructive action of a river like the Mississippi lowers its whole basin on an average one foot in 6,000 years. Among the longest rivers of the world are the Nile, 4,000 m. long, the Mississippi-Missouri, 4,200 m., the Amazon, 4,000 m., the Yang-tse, 3,500 m., the Ob-Irtish, 3,500 m., and the Amur, 3,000 m. The speed of a river varies with the gradient. A torrential stream flows at 18 to 20 m. an hour; a moderate current is about one m. an hour. In flood time the velocity of a river is increased, often with disastrous results, since the increased velocity makes the river change its course suddenly.

Navigable rivers are natural highways, and since their valleys are generally fertile they afford routes through densely populated regions. With the increased size of vessels, only the lower courses of the largest rivers are navigable by ocean-going steamers, but river steamers of shallow draught ply on upper reaches. The head of navigation, which is often, but not always, the head of tidal influences, has determined the site of many great seaports, *e.g.* London and Glasgow.

Deltas frequently interfere with navigation from the sea, as in the Ganges, Mississippi, and Nile, three rivers with long navigable courses. The value of rivers as lines of communication is reflected in the establishment of certain rivers as international waterways, *e.g.* Congo, Danube, Elbe, etc. Unnavigable rivers are often used for floating timber, as in Canada and Sweden. Rivers of high gradients, particularly if interrupted by falls, provide abundant water power in, *e.g.*, Norway, Finland, Switzerland, the U.S.A. Before the industrial revolution this located many industries in Great Britain, such as cutlery at Sheffield, and woollens at Galashiels. Rivers flowing through dry lands are valuable for irrigation, *e.g.* Nile and Euphrates. All production in these basins has always been based on irrigation. Rivers are also of great importance in connexion with the supply of water to towns. See Amazon; Canal; Delta; Mississippi; Nile; Physiography. Reservoir; Thames; Transport:



Riva, Italy. The town at the northern end of Lago di Garda

Water Power. *Consult* The Work of Rains and Rivers, T. G. Bonney, 1912; Our Rivers, J. W. Kempster, 1948.

R. N. E. Brown

Rivera. Department of N.E. Uruguay. It is bounded N.E. by the Brazilian state of Rio Grande do Sul; S. and W. by the dept. of Tacuarembó; E. by Cerro Largo. The surface is undulating pasture land, supporting large herds of cattle. Gold is found, and cattle and animal products are exported. Area, 3,793 sq. m. Pop. 75,464. Rivera, the capital, is in the extreme N. of the dept., on the rly. which crosses into Brazil. Pop. approx. 22,000.

Riverdale, ARTHUR BALFOUR, 1st BARON (b. 1873). British industrialist. Born in London, he



was educated at Ashville College, Harrogate, and joined a steel-manufacturing firm in Sheffield, becoming a specialist in the production of high-speed steel alloys, and managing director of Arthur Balfour and Co. Master-cutler of Sheffield, 1911-12, he served on many government committees connected with heavy industry, notably the royal commission on railways, 1913, and the coal commission 1919, and was a delegate to the economic conference 1927. He was chairman of the advisory council for scientific and industrial research, 1937-46, and president of the British Council, 1947-50. A baronet in 1929, he was in 1935 raised to the peerage as Baron Riverdale of Sheffield.

River Engineering. Branch of civil engineering dealing with the canalisation, diversion, and maintenance of rivers and with works for their improvement generally. In Great Britain the responsibility for keeping rivers in condition to perform their principal function—to discharge the water which falls upon their watershed to the sea or another river—is vested in catchment boards and river boards provided by the Land Drainage Act. The same or another authority may control navigation.

Canalisation includes all work involved in rendering navigable a river or stream which in its natural or existing state is either wholly or partially unnavigable for any or all of the following principal

reasons: variation of flow due to tidal range or rapid fall; alternate drought and flood; insufficient volume of water; the presence of shoals, rocks, etc., or the formation of a bar, sandbanks, or a delta at its outlet; tortuous course; variations in depth and width due to scour, silting, or the absence of proper banks; the existence of low level bridges. To determine whether a river can be made navigable, it is necessary to ascertain the sources and volume of water, the variation in flow, whether this flow can be increased or rendered more uniform, the gradient or fall, especially of the section to be canalised, the causes and extent of obstructions and the practicability of their removal and of subsequently maintaining a navigable channel, and the rights and interests of riparian owners and public authorities.

Deltas are formed by the sediment carried down by the stream and deposited at the mouth; bars and sandbanks are due to similar causes. The remedies are dredging or the construction of training jetties or banks. Rock is removed by blasting or breaking, followed by dredging. Shoals of sand and mud are dredged until a sufficient depth and width are attained. A tortuous course may sometimes be greatly improved and shortened by dredging or excavating new channels across sharp bends. Low bridges which obstruct navigation may be raised or replaced by high level bridges, or, where the approach gradients do not permit of this, by movable bridges of the swing, lifting, or transporter type—though these hinder road traffic. A section of undue width may be reduced and the stream kept within desirable bounds by the construction of continuous banks or detached dykes.

Where the volume of flow is insufficient, it may be possible to increase it by diverting other sources of supply into the stream, but cases are rare in which a serious shortage could be made good in this way.

River engineering deals with the variation of flow due to alternating periods of drought and flood. Frequently natural river beds are only of sufficient capacity to provide for normal discharge; consequently during floods rivers overflow their natural boundaries and inundate low-lying country. Not only does this damage land, buildings, etc., but as a result of flooding and the deposit of sediment brought down from higher levels, some

ivers change their courses for considerable distances.

To provide against these effects the following methods may be adopted: (1) Dams and reservoirs may be constructed, if possible, in the upper regions, by means of which flood water may be stored against the dry season, as at Assuan on the Nile. Such works are usually carried out in connexion with water supply and irrigation. (2) The construction of continuous banks or detached dykes on low-lying sections, where flooding and erosion occur, may direct the stream into a definite channel. With this must be a system of cross dykes for guiding the flood water back again into the river, and so preventing scour behind the banks. Continuous banks are suitable where ordinary flood water can be entirely contained, but for large rivers the cost is often prohibitive, and detailed lengths of dyke are put up especially on curved sections, where the centrifugal force of the current has the worst effect.

Control by Weirs

Variations of flow due to tidal range or rapid fall may be corrected by the division of a river into sections known as reaches, this being done by the construction of weirs across the waterway at intervals determined by the full. By this means a gentle fall, unaffected by tidal variations, is maintained between the weirs, over the crest of which the water discharges itself into the channel below. The two commonest forms of weir are solid dams and dams with sluice gates, which may be raised during floods to hasten the discharge of flood water. At each weir a lock is provided through which boats may pass from one reach to another. In addition to a lock a ramp is occasionally provided, up and down which small craft can be hauled by hand.

The diversion of a river consists either of deflecting its course into a channel which it previously occupied and executing the necessary works to prevent another change of course, or, more frequently, of excavating a new channel. In such undertakings the new channel is either excavated as far as possible in the dry, the water being admitted on its completion, or the work is performed by dredging. *See* Assuan; Canal; Dam; Dredging; Irrigation; Lock; Weir; *consult* River and Canal Engineering, E. S. Bellasis, 1913; Control of Water, P. A. M. Parker, 1932; River Engineering, F. J. Taylor,

1938; Drainage and Flood Control Engineering, G. W. Pickles, 1941.

River Hog (*Potamochoerus*). A species of ungulate mammal found in W. Africa. It has



River Hog. Species found in herds in the swamps of W. Africa

bright red bristles, and is often known as the red river hog. It occurs in herds in swampy parts of the forests, usually near rivers, and feeds upon plants and roots, often doing great damage in the native plantations.

Riverina. Dist. of Australia, in New South Wales. It includes all the counties situated between the Lachlan and Murray rivers W. of the meridian of Wagga-Wagga. Entirely a lowland with an average rainfall of 20 ins., and possibilities of irrigation from the Murrumbidgee and the boundary rivers, and comprising a small artesian basin, which yields subterranean water through bores, the Riverina is an excellent wheat-growing area and suitable for sheep rearing. The Murray red gum is localised here. Most of the dist. is nearer Melbourne than Sydney, and the rlys. run S. to Melbourne and E. to Goulburn and Sydney. Deniliquin and Hay are the largest towns of the district.

River Plate. Combined estuary of the Uruguay and Paraná rivers in S. America. It provides an entrance for merchant ships to the ports serving the vast food-producing areas of the pampas. See La Plata, Rio de. For the battle in 1939, see Plate, Battle of the River.

Rivers, EARL. An English title held in turn by the families of Woodville and Savage. In 1466 it was given to Sir Richard Woodville, but it became extinct when the 3rd earl died in 1491. In 1626 it was revived for Thomas Darcy, from whom it passed to a grandson, John Savage, who became the 2nd earl in 1640. It remained in this family until the death of the 5th earl, a priest, in 1735. It is supposed that the name was first taken from that of a Devon family.

Richard Savage (c. 1660–1712), who became the 4th earl in 1694, was notorious for gallantries and debaucheries. He showed himself a soldier of ability in the wars against France, after which he became a general, master-general of the ordnance, and commander-in-chief. As an M.P. he was concerned with the accessions of William of Orange and George I. He is the earl who lived with the countess of Macclesfield, and was claimed as his father by Richard Savage (q.v.). He died Aug. 18, 1712.

Rivers, RICHARD WOODVILLE, 1ST EARL (d. 1469). English statesman. Of a Northamptonshire family, he served in the French wars, and made his fortune by marrying Jacquetta of Luxembourg, widow of the duke of Bedford, 1436. Temporarily disgraced for presumption, he regained the king's favour, and in 1448 was made a baron. A staunch Lancastrian under Henry VI, he changed sides under Edward IV, and in 1466 became treasurer and was created Earl Rivers, his daughter Elizabeth having married the king two years previously. On the defeat of Edward at Edgecote Rivers fell into his enemies' hands and was executed, Aug. 12, 1469.

Rivers, ANTHONY WOODVILLE, 2ND EARL (c. 1442–83). English statesman. Son of the 1st earl, he



2nd Earl Rivers, the English statesman, who wrote the first book to be printed by Caxton's press, is seen presenting the volume to Edward IV

fought at Towton in 1461, and in 1469 became governor of Calais and succeeded to his father's title. He acquired great influence in the Yorkist party, for whom he de-

fended London. His chief claim to fame lies in the fact that his Dictes and Sayings of the Philosophers (trans. from the French) was the first dated book from Caxton's press (March 18, 1477), and therefore almost certainly the first book printed in England. On the death of Edward IV, Rivers fell a victim to the malice of Richard III, and was beheaded at Pontefract, June 25, 1483. See Bible.

Riverside. City of California, U.S.A., the co. seat of Riverside



Riverside, California. An aerial view of the city, noted for its avenues

co. It stands on the Santa Ana river, 58 m. E. by S. of Los Angeles, and is served by rlys. The neighbouring district produces oranges and lemons; here the seedless orange was evolved in 1873 and the university of California maintains a citrus experimental station. Portland cement is manufactured. Riverside was settled in 1870 and incorporated in 1883. The chief of its famous drives is Magnolia Avenue, 10 m. long. Pop. 34,696.

Riverside Drive. Thoroughfare of New York City, lining the W. escarpment of Manhattan I., overlooking the Hudson R. It runs from 72nd Street northwards to Dyckman Street, a distance of nearly 7 m. On the river side of the roadway is a continuous strip of parkland, the other side being faced by flats and mansions, once fashionable. There are several handsome statues and monuments, as well as the tomb of Gen. Grant. From a house on the drive, Samuel Morse received the first telegraph message from Philadelphia. Riverside Church, at the corner of 122nd Street, is a famous institutional centre, nominally Baptist; it was built with financial assistance from J. D. Rockefeller, jr., and was completed 1929. See New York illus., pp. 6063, 6065.

Riveting. A method for joining the edges of metal plates or

sheets. Rivets are pins with shouldered heads at each end, which can be fitted into holes, previously drilled, punched and reamed, through two or more plates, in such a way that the plates are gripped tightly together between the shoulders, as shown diagrammatically. As a rule the rivet is supplied with one head already formed and the riveter fits it through the plates and then forms the second head *in situ*. Generally, in forming the second head the rivet stem expands tightly against the sides of the hole. Riveting is used extensively in constructional engineering, ship-building, boiler-making and aeronautical engineering, though it has to some extent been superseded by welding.

Although rivets can be made from various metals, e.g. wrought iron, steel, copper, aluminium, magnesium, many metals and alloys cannot be used. Apart from strength, the selection of a metal for a rivet is dependent on two main factors:

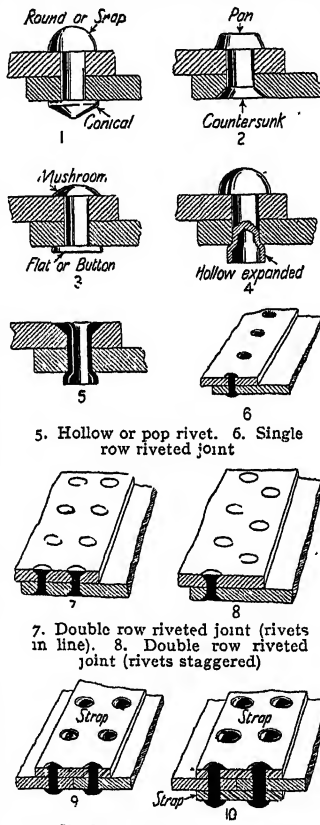
(1) The nature of the metal of which the plates which are to be joined are made must be considered carefully. Electrochemical corrosion (*q.v.*) must be avoided and the plates must not be damaged by the riveting process as might happen if the rivet material is much tougher than the plate.

(2) The method or methods by which the heads of the rivet are to be formed, particularly the second head, are important, e.g. iron and steel rivets are usually forged from red-hot metal rod, whereas aluminium rivets are forged from cold metal rod.

Various types of rivets are used, the main difference between them usually being in the form of head. Examples of different types of heads are shown in Figs. 1-5. Fig. 1 shows a rivet with one round, or "snap," head, which is probably the most popular type, and one conical head. Fig. 2 shows one "pan" and one countersunk head. Fig. 3 shows one "mushroom" head (flatter than the hemispherical "snap" head) and one flat, or "button," head. Fig. 4 shows a "snap" headed rivet with a hollow expanded end. This may be expanded in place by detonating a small explosive charge held in the hollow end. Fig. 5 shows a hollow, or "pop," rivet with a countersunk head at one end and an expanded head at the other. This hollow type is much employed in aircraft since this form can be

fitted by one riveter, without assistance, and entirely from one side of the plates if necessary.

Rivets can be used only on plates which overlap each other, and are most often used in groups or rows. Their relative size and spacing must be decided according to the nature of the plate and rivet materials in conjunction with the required strength of the joint. A single row of rivets (Fig. 6) can give up to 60 p.c. of the strength of the solid plate, while a double row, either in line (Fig. 7) or



Riveting. Examples in common use. See text

staggered (Fig. 8) can give up to 75 p.c. plate strength. A triple row can give up to 85 p.c. plate strength. Sometimes it is not convenient to overlap the actual plates, and then they may be joined by a single or double strapped butt joint (Figs. 9 and 10). There are various and numerous modifications to all these kinds of joints.

Rivets can be formed by hand or by machine. A riveted joint is not gas or water tight and, if such

a tight joint is required, either a sealing compound must be sandwiched between the lapped plates or the inner edge of one plate must be caulked by hammering along it with a caulking tool.

Riviera. Narrow coast strip on the Ligurian Sea (*q.v.*), extending from Fréjus to Leghorn. Backed by the S. slopes of the Maritime and Ligurian Alps and the Ligurian Apennines, it stretches for 140 m. E. and W. of Genoa as the Riviera di Levante and Riviera di Ponente respectively. With all the charm of a mt. background, a delightfully sunny winter climate, rich typically Mediterranean vegetation, and a wonderful glow of colours, it is a noted tourist resort.

In the W. the French littoral surrounds the principality of Monaco; here are Cannes, St. Juan-les-Pins, Antibes, Nice, Villefranche, Monte Carlo, and Mentone. In the larger Italian section to the E. are Ventimiglia, Bordighera, San Remo, Savona, Genoa, Rapallo, and Spezia. The indigenous flora has been so enriched with imported plants that there are specimens of all the most notable plants of the world, including thirty species of palms, eucalypts, and camphor trees. The season extends from November to May. Communications include the Corniche roads, the P.-L.-M. and Italian state rlys. and steamers.

As a health resort the Riviera is specially suited to sufferers from chronic rheumatism, nervous disorders, various chronic forms of catarrh, asthma, and the early attacks of phthisis, as well as to convalescents from other diseases who require reinvigorating; such visitors can readily find suitable resorts off the main roads and away from the fashionable spas.

Minor resorts, beginning in the E. and going W., are Pietra Santa, with the cathedral of San Martino, the church of Sant' Agostino, and the Battistero; Seravezza, with marble quarries inaugurated by Michelangelo in 1517 and a palace of Cosimo I erected in 1559; Santa Margherita, with an ancient church and the Castello Cervera; Camogli, with a school of navigation and the memory of its former greatness as a port for sailing vessels; Rocco, birthplace of Niccolò da Recco, who discovered the Canary Islands, with the parish church of San Giovanni; Bogliasco, with picturesque ancient Roman bridge; Varazze, with shipbuilding yards and the 12th century church of Sant' Ambrogio. See Corniche, La; Genoa; Mentone;



Riviera. Map of the French and the western portion of the Italian Riviera.

Inset, plans of Nice and Monaco

Nice. Consult The Riviera and the Corniche Road, Sir F. Treves, 1921; A New Handbook to the Riviera, 1930.

Riviere, BRITON (1840-1920). British painter. Born in London, of Huguenot descent, Aug. 14, 1840, he was educated at Cheltenham and Oxford. Riviere exhibited three pictures at the R.A. when 17, and established his reputation by his Academy picture, Charity, in 1870. He became an animal painter of remarkable skill, and among his notable successes were Croc, 1871, widely circulated as an engraving; Daniel, 1872; Sympathy, 1878; Actaeon, 1884; Adonis Wounded, 1887. Examples of his work are in the Tate Gallery. Elected A.R.A. in 1878, and R.A. in 1881, he died April 20, 1920.



Briton Riviere,
British painter

Rivière du Loup. River of Quebec, Canada. It rises in the highlands of the province, in the Grand Lac des Îles, flows through the Lac au Sorcier, and continuing S. falls into the St. Lawrence about midway between Montreal and Quebec in the lake of St. Peter, one of the expansions of the great river. The town of Rivière du Loup

stands on the right bank of the St. Lawrence, 115 m. below Quebec on the C.N.R. and Temiscouata rly. Pop. 8,713.

Rivington, CHARLES (1688-1742). English publisher. Born at Chesterfield, he was apprenticed to a London bookseller, and in 1711 took over the business of R. Chiswell under the sign of the Bible and Crown. Religious and philosophical publications issued by him established the reputation of the firm. In 1741-42 he published Richardson's Pamela. Dying Feb. 22, 1742, he was succeeded by his son, John (1720-92), who, becoming publisher of the S.P.C.K. in 1760, extended and widened the scope of business by editions of English classics. On his death the business was carried on by his sons Francis (1745-1822) and Charles (1754-1831), who started The British Critic in 1793. The business passed to the children of these brothers, and was taken over by Longmans in 1890.



Charles Rivington,
British publisher

Rivoli. Town of Italy, in the prov. of Turin. It is on a ridge, 8 m. W. of Turin, with which it is connected by rly., and is a resort for merchants of Turin. The chief

occupations of the inhabitants are the manufacture of silk and of macaroni. Rivoli was in that part of Italy liberated from the Germans by Italian patriots at the end of April, 1945. The 18th century castle was gutted.

Rivoli. Village of Italy, in the prov. of Verona. It stands on the river Adige, and is on the main route from Tirol, 13 m. N.W. of Verona. Here on Jan. 14-15, 1797, the French gained a notable victory over the Austrians. After their defeat at Arcola (q.v.), the Austrians gathered their forces for an attack on the French, who had established themselves on the heights of Rivoli. On the morning of Jan. 14, Napoleon began the battle by a charge against the Austrian centre. Ably supported by Joubert and Masséna, he inflicted a crushing defeat, driving the panic-stricken enemy before him and taking over 12,000 prisoners. Masséna earned the title of duke of Rivoli for his services in the battle.

Riyadh. One of the capitals of Saudi Arabia, Mecca being the other. Nearly 500 m. N.E. of Mecca, it occupies a depression in the plain, and is almost enclosed with date gardens, which are irrigated by buckets from deep wells. The town is surrounded by high mud-brick walls protected by a ditch, there being six fortified gates. The principal mosque is

adjacent to the huge palace of the ruler. The people, 150,000 in number, are Wahabite Mahomedans.

Rizal, José (1861-96). Filipino author and patriot. Born at Calamba of Malay stock, he was educated at the Jesuit college in Manila. He went to Europe to study medicine and became a skilled optical surgeon; but his studies, begun in Madrid, were extended in Paris, Heidelberg, and Berlin to cover philology and the social institutions of Europe. In 1886 he published in Spanish a novel, translated into English as *Friars and Filipinos*, 1900, which was a powerful indictment of Spanish rule in the Philippines and of the greed and bigotry of the religious orders there. He was forced to leave his native island a few months after his return, and published in 1891 *El Filibusterismo*, a sequel to his earlier novel. After receiving assurances of personal safety, he returned to Manila in 1891, but was banished to Mindanao on a charge of organizing a secret society. In 1896 he volunteered to take part in a campaign against yellow fever in Cuba, but was seized on the way, brought back, and shot as a traitor, Dec. 30.

Riza Shah Pahlevi (1877-1944). Persian ruler. This army officer in 1921 led a force of 4,000 against Teheran, and with its capture became minister for war and c.-in.-c.; as virtual ruler of Persia he secured a degree of order unknown for many years. In 1923 the shah Ahmed Kajar fled to Europe, and Riza appointed himself prime minister; and on Dec. 16, 1925, after the Majlis (national assembly) had deposed the shah, he was chosen to succeed, the throne becoming hereditary in the Pahlevi family. During his reign he greatly improved communications, laying or repairing 10,000 m. of roads and constructing the Trans-Iranian rly. When the British and Russians entered Persia in 1941 he abdicated, Sept. 16, in favour of his son Mohammed, and left the country for Mauritius. He died in Johannesburg, July 26, 1944, and was buried in Cairo, his body being reinterred near Teheran May 7, 1950.

Rizzio or Riccio, David (c. 1533-66). Italian musician, favourite of Mary Queen of Scots. A native of Pancalieri, near Turin, he came to Scotland as an attendant of an Italian envoy. Mary gave him an appointment in her court, first as a singer in the chapel, then as a valet de chambre, and finally as secretary. This pro-

motion of a foreigner and R.C. in the royal favour, which took place about the time of the marriage

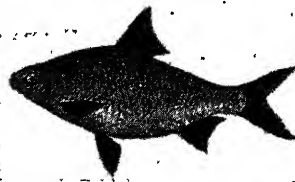


David Rizzio, favourite of Mary Queen of Scots

with Darnley, roused the suspicions of the Reformers, and rumours of intrigues with Rome began to grow current. Rizzio's influence at court increased, and by about 1564 he was one of the most powerful persons in the kingdom, rich and haughty. This made the nobles jealous, while Darnley believed that the queen and her servant were lovers. The outcome was a plot to kill Rizzio, and the deed was carried out, March 9, 1566, at Holyrood, after he had been dragged from Mary's presence. The conspirators showed their vindictiveness by inflicting 56 wounds upon the body. See *Mary Queen of Scots*.

Rjukanfos (Nor., reeking or foaming fall). Grand cascade of Norway, in Telemarken. It is formed by the river Maane, which makes an almost perpendicular descent of 415 ft.

Roach (*Rutilus rutilus*). Common fresh-water fish. It is found in nearly all British rivers, and in



Roach. A specimen of the common variety of this European fresh-water fish

most European rivers N. of the Alps. It is of silvery colour, with red fins in the adult. The eggs are attached to aquatic plants, and hatch out in a week or fortnight, according to the temperature. This is a popular fish with the angler, as its wary habits call for considerable skill to take adult specimens, but its qualities as a table fish are poor.

Road Board. Former department of the British government. Set up in 1909, its function was to make grants to local authorities for the construction of new roads and the improvement of existing ones. Its income, derived from a percentage of the duties on petrol and from vehicle licences, averaged £15 000,000 a year.

The board was merged with the ministry of Transport in 1919. See *Road Fund*.

Road Fund. Fund established by parliament in 1920 to be used for general expenses connected with the roads of the U.K.; from it also grants or advances on loan were made to highway authorities for road construction and repair. Originally, all sums paid in respect of vehicle excise duty licences were carried to the road fund, but this was later reduced to two-thirds of these amounts. At first all sums paid into the road fund were reserved for road expenses, but in 1926 the practice started of transferring ever-increasing sums from the road fund to the Exchequer for general revenue or to achieve a balanced budget; this was called "raiding the road fund."

Under the Local Government Act of 1929, the road fund passed under the control of the Treasury, and the system of making grants from the fund to highway authorities ceased, the grants being made to the Exchequer which in turn transferred them to the county councils concerned. In 1937 motor licence duties ceased to be paid into the road fund, and the liability of the Exchequer to transfer licence duties, less its authorised share, to the road fund ceased. Such licence duties then went to general revenue, and amounts were paid into the road fund from moneys provided by parliament.

Road Numbering. Method of designating main roads in Great Britain. Each road is given an official number, which appears against the road on road maps and also on roadside signposts. It is preceded by a letter, A, B, or C, indicating its class. Six of the nine main arterial roads in Great Britain radiate from London and are numbered clockwise as follows: 1, Berwick and Edinburgh; 2, Dover; 3, Portsmouth; 4, Bath; 5, Holyhead; 6, Carlisle; and three from Edinburgh; 7, Carlisle; 8, Glasgow and Gourrock; 9, Inverness.

Road Racing. Term used to describe motor car and motor cycle races held on the open road, as distinct from those run on specially laid out tracks. Most countries hold grand prix, which are for cars designed for racing, while the Le Mans and R.A.C. tourist trophy races are for normal sports cars. These races are for 24 hours, entailing the use of headlamps and more standard car

equipment than is found in grand prix cars. Somewhat similar types of road racing are the Isle of Man, Targa Florio (Sicily), and Monaco grand prix. These races are essentially tests of corners, acceleration, and braking. High top speed is necessary, but it can never be maintained for any long period owing to the winding nature of the course. The Monaco grand prix is run through the town of Monaco, and, from the spectators' point of view, is considered to be the most thrilling motor car race in the world. In England road racing, as distinct from reliability trials, is illegal on normal roads. Donington Park course, opened in 1934, reproduces road conditions in a confined space.

Motor cycle road racing is the most strenuous of all mechanical sports. The first event of this kind was held in the Isle of Man in 1907 and developed into the tourist trophy event. The race, which is held in 37-m. laps, is 259 m. long and is run in three

separate classes, senior, junior, and lightweight according to the engine rating. Motor cycle road racing is a sport in which British manufacturers and riders have always excelled. Their only serious competitors were the German cycles and teams, which were first entered for the leading events in 1936. See *Motoring*.

Road Research Laboratory. British research organization. Situated at Harmondsworth, Middlesex, the laboratory is a unit of the dept. of scientific and industrial research, and is directed by a board. It is concerned with the testing of road surfacing materials for durability and non-skid properties, and the testing of new lighting systems. Road surfacing materials are tested on a circular track over which wheels of various vehicles are rotated. Experimental stretches of tested materials are laid on the main road outside the laboratory and subjected to prolonged trial in normal traffic conditions.

ditches (*sulci*) and the space between was excavated down to the subsoil. Over this a layer of fine earth was spread and rammed down, and upon it laid the *statumen*, consisting of two layers of flat stones bonded in mortar. Next was laid the *radus*, a 9 ins. thick layer of stone and mortar concrete, to carry the *nucleus*, which was 6 ins. thick and consisted of fragments of stone, brick, and pottery firmly cemented together. Finally came the actual road surface, or *pavimentum*, made up of large stone slabs 6 ins. thick carefully cemented together. The road surface was given a slight camber for drainage, and the sides had a low stone edging. Most of the roads had a depth of 3 ft. from foundation to surface.

During the Roman occupation of Britain, four main groups of roads were built radiating from London: one north-eastwards through Colchester to Lincoln and York; a second, later known as Watling Street, through St. Albans to Chester; a third south-easterly through Canterbury to the Kentish ports; and a fourth westerly to Silchester and thence to the south-west of England. A fifth road ran diagonally across England from the S. coast to the N.W. bastions of the Roman wall along the Scottish border. The roads now known as Ermine Street, the Fosse Way, and Icknield Way, which followed the lines of the primitive track roads of the early Britons, were not of great importance in the Roman system of roads in Britain.

Lost Art of Road Building

After the fall of the Roman empire, the art of building durable roads was lost, and during the Middle Ages the greater part of the existing Roman roads was allowed to fall out of repair, particularly in Britain, where bridle paths and mere tracks again became common.

In medieval England the usual practice was to lay another track alongside when the original wore out. The generally bad state of English roads was due chiefly to the state of the law, which compelled each parish to maintain its own roads. One of the earliest English road laws, passed in 1285, was not concerned with road surfaces, but merely with the cutting down of roadside hedges to prevent concealment of robbers. In the neighbourhood of London the roads were kept in repair by a system of tolls, first levied in 1346. In 1555 an Act required each parish to appoint surveyors to keep the roads in order by compulsory

ROADS AND ROAD-MAKING

David Le Roi

The history of roads, and of methods of making them, is here given, together with the chief ways of constructing and planning roads used in the 20th century. Allied articles include Alcan Highway; Appian Way; Autobahn; Ermine Street; Fosse Way; Highway; Icknield Way; Ledo Road; Pan-American Highway; Road Research Board. See also McAdam, J. L.; Telford, Thomas; Wade, George

Man's first roads were the tracks along which the communities of the Old Stone Age fetched their flints and salt 30,000 years ago, and as civilization has developed, so has the road. It was an essential element in the material advancement of a nation, and the condition in which it was kept, particularly where there was no alternative means of communication, as by river or coastwise shipping, was, until the introduction of rlys., a sure indication of the state of trade and industry and of the authority of government. All the great military powers have been road builders, as an efficient system of roads maintained in good repair was necessary for the rapid movement of armies. In island countries such as those of the British Isles, where there was little danger of sudden invasion, the building and maintenance of strategic military roads was of small importance.

One of the earliest of the road building nations was ancient Egypt, and in the time of Cheops 100,000 men were annually engaged in the building and maintenance of roads. Babylon was the centre of an elaborate system of paved roads extending to the far-

thest outposts of the Assyrian empire, and the city states of classic Greece were linked by well drained and surfaced highways. The Carthaginians were great road builders and it was from them that the Romans learned how to build the military "ways" which everywhere followed in the wake of Roman conquest. The men of the ancient civilizations of Mexico and Peru were also great road builders.

Except when some insuperable barrier intervened, Roman roads followed a straight line from start to finish, crossing hills, marshes, and ravines which could have been avoided by only slight deviations. They were usually surveyed and laid out in a line with some prominent landmark, so that their straightness was generally a matter of convenience. Roman roads were so solidly constructed that many of them have survived the traffic of 2,000 years to provide existing details of early road making. In general their method of construction was that adopted in the building of the famous Appian Way, started in 312 B.C. Having laid out the line of the road, its width, which varied from eight to 20 ft., was marked by two parallel

labour; some years later the statute labour tax was substituted for compulsory labour. But these enactments achieved little.

It was not until the introduction of the turnpike system under Charles II that a few of the more important arterial roads were made even passable to vehicles. Between 1726 and 1737 Gen. Wade built some 250 m. of roads of 16 to 18 ft. width, mainly with a view to pacifying the Highlands after the rebellion of 1715. In general, however, British roads continued in a deplorable condition even as late as 1770, as attested by Young in his *Six Months Tour*.

Continental Roads

Roads on the Continent, particularly in France and Italy, were generally in better state, chiefly for military reasons. In 1508 Henry IV of France appointed a great waywarden responsible for the building and upkeep of roads in that country, most of which followed the old Roman routes. In 1556 a stone road 15 ft. wide was constructed from Paris to Orleans and provided the model for later trunk routes.

Louis XIV did much to improve French roads, but their surface was liable to rapid wear until the mid-18th century, when Jules Tresaguet introduced the principles of construction upon which Telford and McAdam later based their systems. Tresaguet dug out the line of the road to a depth of 10 ins., and then laid a curved bed of earth in which large flat stones were set on edge with their tops broken off to form an even surface. The spaces between the stones were filled with smaller slabs, also with their tops cut level. The interstices between the two courses of upright stone were filled with hard gravel and rammed firmly to provide the road surface. Tresaguet's method was used for the network of military roads built by Napoleon to link the key points of his Continental empire.

In England, only the pressure of public opinion compelled the turnpike trusts to adopt the roadmaking methods introduced by Telford and McAdam. Telford retained the single course of large stones on edge introduced in France, but placed them on the bed of a level trench, securing a camber, or curved surface, by using large stones in the centre and smaller stones at the sides. Over the whole he spread an inch-thick layer of gravel. The top surface, or carriageway, consisted of a 6-in. depth of hard, broken stone firmly

rammed down. McAdam used only broken stone from the finished surface of the earth foundation upwards, raising the stone bed above the earth at each side instead of sinking it in a trench. McAdam's roads were always better drained than those built by Telford and depended for their solidity on the thorough compacting of the broken stones under the pressure of passing traffic.

McAdam and Telford constructed many hundreds of main roads in Great Britain, including the trunk roads between Glasgow and Carlisle, and Shrewsbury and Holyhead. These two engineers revolutionised Great Britain's road system; but, with the introduction of railways and the consequent suspension of road traffic except in the immediate vicinity of towns, British trunk roads again fell into neglect.

About 1910 the rapidly increasing volume of motor-vehicle traffic, with speeds and wheel loads never contemplated by earlier roadmakers, again focused attention upon road construction and maintenance. The picturesque irregular roads that formed the majority of highways in Great Britain did not meet the requirements of rapid transport. Thus the existing camber, or surface curvature, originally introduced to ensure drainage of rainwater from the crown of the road into ditches at the sides, was found excessive for fast motor traffic. It was a source of danger on right hand curves, where it increased the tendency of a vehicle to overturn, although it was an advantage in turning to the left.

Effect of Motor Traffic

As the speed of motor traffic increased it was found necessary to adopt the railway practice of banking to give the road some super-elevation on the outside of the curve, and sloping uniformly from the outside to the inside. With the development of mechanical road transport, gradient ceased to be one of the ruling factors in road construction. In the days of horse traction, the minimum permissible gradient was fixed by the tractive effort of horses hauling a heavy wagon. On a first-class level macadamised road the tractive force exerted by a horse to move a load of one ton varied from 38 to 45 lb.; with a gradient of 1 in 50 the tractive force would have had to be doubled. The tractive force also doubled when a level road deteriorated and became loose and muddy. The material with which the surface of a road is

covered similarly affects tractive effort; thus, in the case of motor traffic, an ordinary water-bound macadam road can have a steeper gradient than one with an asphalt carpet, as the latter becomes slippery in certain climatic conditions. In Great Britain the average gradient of the motor road varies between 1 in 20 and 1 in 30; the latter being preferred.

20th century Construction

Basically, 20th century road construction differs little in principle from that introduced by McAdam, later developments being chiefly in relation to the materials used for surfacing. The foundation is similar, improved by rolling with the heavy steam roller which he did not know and which permits the stones and gravel to be more solidly bonded together with water. Much harder stones are now used, the heavier initial cost being offset by lower upkeep charges. The best road metals are basalts, syenites, and granite, most of them obtained from the Cleve Hills in Shropshire.

To prevent the road from disintegrating and to provide it with a carriageway which is both resilient and watertight, the road is given an upper surface which will amalgamate into a continuous carpet. The most efficient carpet for a macadamised road is formed of broken granite, slag, or granite chippings coated with some tar product. The matrix is spread to a depth of three-quarters of an inch, and the prepared stone is distributed over it in two layers. The road is then rolled until the matrix works up between the pieces of stone; more binder is applied to the top and rolled in. The surface is sealed with a coating of hot tar and sprinkled with fine chippings. For roads carrying comparatively light traffic, a less expensive surface consists of a spraying of tar sprinkled with chippings.

Many of the roads laid down in Great Britain after 1926 were built of concrete. Where the subsoil is weak, or where the traffic is exceptionally heavy, the concrete is reinforced with steel mesh, placed at about one third the thickness of the concrete above the earth bed. The concrete varies from 7 to 10 ins. in thickness and is usually poured in two layers. To prevent cracking of the surface due to climatic expansion, the concrete is laid in sections with a space between adjacent sections filled with some pliable material such as bitumen. A number of roads, particularly trunk highways, have a

7-in. concrete foundation upon which is laid a surface carpet similar to that superimposed on macadamised roads. The principal advantage of concrete roads and foundations is that they can be quickly laid by machinery specially constructed for the purpose.

Other materials used for road surfaces are creosoted wood, iron, rubber, stone settes, and asphalt. Tarred wood paving laid on concrete and given a top dressing of tar and fine gravel is extensively used in London and other large cities. Iron roads have been successfully tried on test sections over long periods; the iron, in the form of studded triangular plates with honeycombed under-surfaces, is laid on concrete. The iron is hard-wearing and the studding, eliminating tyre suction, prevents the splashing of mud. An experimental length of rubber surfaced road laid at the N. approach to Blackfriars Bridge, London, gave more than 10 years' efficient service.

Many urban roads have a concrete foundation upon which is superimposed a 3-in. carpet of asphalt, a mixture of bitumen and finely-graded mineral matter. The disadvantage of the untreated asphalt surface is that it is too smooth, and is liable to induce skids in certain weather conditions, particularly when rain has just started to fall or when the road is partially dry; a thin layer of mud of an oily consistency then prevents the tyres from biting through to the solid surface. The smooth surface of the asphalt road carpet can be obviated by a top dressing of tar and sand, or tar and chippings.

For very heavy continuous traffic, as in the neighbourhood of docks, the road surface sometimes consists of granite settes, laid on a hardened concrete foundation. A bedding layer of sand is interspersed between the settes and the concrete foundation, and the joints between the settes are filled with chippings and pitch.

In general, all but the newest main roads in Great Britain follow the routes of the coach roads; they are winding, have many blind corners and junctions dangerous for fast traffic, and pass through heavily built up areas. To reduce fast traffic dangers numerous by-pass roads were built after the First Great War, and roundabouts and fly-overs were constructed to avoid right-angle crossings.

In 1937 the ministry of Transport took over for national control 4,500 m. of major roads in Great

Britain, and was given powers to include as trunk roads any new by-passes and diversions relating to major, or trunk, roads. In 1946, the ministry became highway authority for a further 3,705 m. of British trunk roads. The Act of 1946 further authorised the ministry to construct a number of inter-connecting roads between various parts of the country, and the bridges and tunnels to carry them over or under navigable waterways, and to remodel junctions and intersections. The ministry was also empowered to acquire land adjacent to trunk roads where such acquisitions would preserve national amenities, and to purchase, with a few exceptions, all privately owned bridges.

There are 180,670 m. of public roads in Great Britain, of which 154,694 m. are in England and Wales, and 25,976 m. in Scotland. They are classified according to condition and weight of traffic by the ministry, 27,721 being class 1 roads; 17,707, class 2; and 48,210 class 3. In 1915, £18,800,000 was spent on the construction and maintenance of British roads; in 1937, £68,000,000.

Road construction on the Continent has in general followed British practice, except in Germany, where the Hitler regime developed the *autobahn*, or strategic motor highway, and in Italy, where the fascist state constructed some outstanding mountain roads. In America, road builders have used concrete to a greater extent than in any other country, and their roads are noted for their undeviating routes and capacity to carry heavy volumes of fast traffic. America has also developed to a greater extent than elsewhere the fly-over system at crossings.

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Road Sign. Notice conveying information briefly by picture or word to road users. See Sign.

Road Town. The only town, and capital, of the Virgin Islands (*q.v.*). It is situated on the S.E. coast of Tortola, and is a port doing trade in fish, poultry, vegetables, and charcoal. Pop. 681.

Road Traffic Acts. Acts of parliament regulating motor vehicles and their drivers. The main Act is the Road Traffic Act, 1930. There are many amending Acts.

Road Traffic Commissioners. Persons appointed under the Road Traffic Acts. There are three commissioners in each traffic area, except the Metropolitan area. Their duty under the Road and Rail Traffic Act, 1933, is to issue licences in connexion with public service vehicles, driving licences for drivers of heavy goods vehicles, and licences for the carriage of goods by road.

Road Transport. This subject is considered under Transport.

Roanne. Town of France, in the dept. of Loire. It stands on the left bank of the Loire, which is navigable at this point, 40 m. N.W. of Lyons. The church of S. Etienne, dating from the 13th-16th centuries, was rebuilt in the 19th century. The hôtel de ville contains a museum of Roman antiquities. There are spinning, weaving, colour, and machinery factories, and anthracite mines. Roanne was known to the Romans as Rodumna, and was the capital of Roannais. It became important in the 15th century and was a duchy in 1566. In 1846 it was inundated by the Loire, much damage being done. Pop. 44,518.

Roanoke. River of the U.S.A. Formed by the confluence of the Staunton and Dan rivers, which have their source in the Blue Ridge, it flows generally S.E. through Virginia and N. Carolina to Albemarle Sound. It is, including the Staunton, 450 m. in length, and navigable by steamers for 120 m. to Weldon.

Roanoke. City of Virginia, U.S.A., in Roanoke co. It stands on Roanoke river, 55 m. W. of Lynchburg, on the Virginian and the Norfolk and Western rlys. Here is Virginia College, and in the neighbourhood are Roanoke, Elizabeth, and other colleges. The name of the city is the Indian word for shell money. Roanoke became a city in 1884. In 1881 its pop. was less than 700; growth is due to the Virginia rly., which has huge repair shops here. Pop. 69,287.

Roaring. Complaint affecting horses. Roaring or whistling in a horse may result from catarrhal affections of the throat, but the

fault more usually arises from defects in the air passages, and is in such case hereditary. It is particularly a failure of the thoroughbred horse, more especially those of Barb stock, but is rarely found in cobs or ponies. There is no cure.

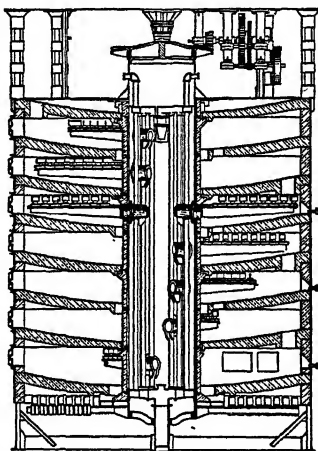
Roaring Forties. Nautical expression used to denote the persistent and often boisterous W. winds in latitude 40°–50° S., over the oceans of the S. hemisphere. Sailing ships rounding the Horn into the Atlantic rely upon these winds; going in the opposite direction such ships are compelled to tack far to the S. to avoid them, and so enter within the limits of pack ice. These winds, blowing for thousands of miles over the oceans, bring regular rains to the W. coasts of Tasmania and S. Island, N.Z.; during the S. winter they carry rain to the S. of Australia.

Roark, Mrs. Aidan. Details of the career of this American lawn tennis player will be found under her more familiar name Helen Wills-Moody.

Roasting. Metallurgical process wherein ore is heated high enough to cause chemical change, but not sufficiently high to melt. Chloridising roasting consists of heating with salt, and the product is a chloride. Sometimes the roasting is conducted at a low temperature and with a limited supply of air to produce sulphates. Such a process is called sulphating. During roasting some minerals become magnetic, and can then be separated by means of a magnet. Oxidising roasting is heating in a current of air, and the products are mainly oxides. With reducing roasting a metal is separated from a chemical compound by a reducing agent such as coal or carbon. See Furnace; Metallurgy.

Roasting Furnace. Furnace used for roasting certain metallic ores to remove some constituent before smelting or to convert the ore into a form suitable for the subsequent metallurgical operations. The simplest form of roasting is in heaps or stalls, where the ore is simply piled into a heap and allowed to burn gradually. Reverberatory furnaces (*q.v.*) and furnaces for blast roasting are the other two types. It may be necessary to keep the gases away from the ore, in which case a muffle furnace must be used. Blast roasting may be carried out with a deep bed of ore in a pot or with thin beds, held in trays or palettes. In either case the air passes right through the bed and a product suitable for the blast furnace is obtained, the

latter process often being known as sintering. The illustration shows the wedge furnace, which is one of



Roasting Furnace. A wedge furnace with seven hearths and revolving rabblers. See text

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the most common designs. The ore is introduced to the top of a series of hearths and is moved across each hearth by rabbling arms, which are driven by a central shaft. As the ore reaches the centre or edge of each hearth it drops through the hole on to the next hearth and so on, until by the time it leaves the bottom hearth it is fully roasted. See Calcination; Metallurgy; Roasting; Sintering.

Roatan or RUATAN. Island off the coast of and belonging to Honduras, Central America. It is 40 m. N.W. of Trujillo and is 30 m. long and 8 m. wide. Covered partly with forest and partly with grassy plains, it yields tropical fruits. Roatan on the S. coast is the administrative centre for the Bay islands, of which Roatan Island is the largest. The people are largely descended from British pirates and mutineers, and English is the only language spoken with fluency. Pop. about 4,500.

Robbery. In law, theft from the person, accompanied by violence. The English law is set out in the Larceny Act, 1916, s. 23, re-enacting an earlier statute. Every person who (a) being armed with any offensive weapon or instrument, or in concert with one or more other persons, robs, or assaults with intent to rob, any person; or (b) robs any person and at the time, or immediately before or after, uses personal violence, is guilty of felony. He may be pun-

ished by imprisonment for life or any shorter period. The essence of robbery is violence or terrorism. See Larceny; Theft.

Robbia, ANDREA DELLA. An account of this Florentine sculptor will be found under Della Robbia.

Robbins, SIR ALFRED FARTHING (1856–1931). British journalist. He was born at Launceston, Cornwall, and educated at the grammar school there. In 1871 he started a career in journalism, and occupied positions on many newspapers, being London correspondent of the Birmingham Post, 1888–1923, and becoming president of the institute of journalists in 1908 and chairman of the press lobby committee during 1914–15. A leading freemason, he represented the grand lodge of England in visits to the U.S.A., the Argentine, Uruguay, and Brazil between 1924 and 1927. He wrote on many subjects, among his books being *lives of W. E. Forster* (1882), *Lord Salisbury* (1882), *Sir Bevil Grenville* (1884), and *Parnell* (1926). He was knighted in 1917, and died March 10, 1931. His son, Alan Pitt Robbins (b. Jan. 21, 1888), was parliamentary correspondent of *The Times*, 1923–38, later becoming news editor, while another son, Alfred Gordon Robbins (1883–1944), was day editor of *The Times* in 1920, later deputy chairman of Ernest Benn, Ltd., and president of the institute of journalists, 1942–43.

Robbins, LIONEL CHARLES (b. 1898). British economist. He was born Nov. 22, 1898, and educated at Southall County school, University College, London, and the London School of Economics. After service in the First Great War he became lecturer at New College, Oxford, then serving on the staff of the London School of Economics, 1925–27. Back at New College as fellow for the next two years, he became professor of economics at London university in 1929. During the Second Great War he was director of the economic section of offices of the war cabinet, receiving the C.B. for his services. He wrote much on economics, among his books being *The Economic Causes of War*.

Robe. Word originally used for a garment, but now applied more especially to one worn on ceremonial occasions. See Costume; Gown; Knighthood.

Robert. Masculine Christian name of Teutonic origin. It means bright fame. It was early popular in France, whence it passed to England and Scotland, becoming

very frequent in both countries. The Italian form is Roberto. Robin is a diminutive. Hob and Rob are contractions used in Scotland; Bob is more frequent in England. Rupert is a variant of Robert. It is frequent in Germany under the form Ruprecht and became known in England owing to the fame of the cavalier prince Rupert. The feminine form is Roberta.

Robert I. King of Scotland. Official designation of the ruler who is better known as Robert Bruce. *See* Bruce.

Robert II (1316-90). King of Scotland. Born March 2, 1316, he was a grandson of Robert the Bruce, his mother being the king's daughter Marjory; his father was Walter the steward of Scotland and, having taken this for a surname, Robert was the first of the line of Steward or Stuart kings who later ruled England. When only two years old, parliament chose him as Bruce's successor, but the birth of a son to Bruce in 1324 changed the position. This son, David II, became king in 1329, and from then until 1371 Robert was one of the chief men of his kingdom. Several times he was made regent, and he was a leader at the battle of Neville's Cross, but later he rebelled against David and was imprisoned. The dissension was healed, and when David died childless in 1371, Robert succeeded. His reign was troubled by wars in which he could take little part. He died May 13, 1390, and was succeeded by his son, Robert III.

Robert III (c. 1340-1406). King of Scotland. The eldest son of Robert II and his mistress, Elizabeth Mure, he was declared legitimate and made earl of Carrick. He was prominent during the reign of his father, and in 1390 succeeded to the throne, taking the name of Robert instead of his baptismal John. As a ruler he was incompetent, and the kingdom was governed by his brother, the earl of Fife, by his son, David, and then by another brother, the duke of Albany. Robert died, a broken man, April 4, 1406. His eldest son, David, duke of Rothesay, having died before him, his successor was the younger son, James I.

Robert I (d. 1035). Duke of Normandy, known also as Robert the Devil. Son of Richard II of Normandy, he succeeded his elder brother Richard III in 1028. He consolidated his authority against various rivals, secured from Henry I of France the Vexin territory, and supported the sons of the English king Ethelred against

Canute. After the pestilence of 1033 in Normandy, Robert set out for the Holy Land, and died of fever at Nicaea on his way home. His only and illegitimate son was William the Conqueror. His sobriquet came from his ruthlessness in war.

Robert II (c. 1054-1134). Duke of Normandy. The eldest son of William the Conqueror, he quarrelled with his father, and in 1079 there was war between them. In 1087 Robert became duke of Normandy and was soon at strife with his brothers, William and Henry. In 1096 he pledged the duchy to William II and went on a crusade, from which, after many daring deeds, he returned to find Henry king of England. Henry bought off Robert's claims, but the two soon came to blows. On Sept. 28, 1106, a battle was fought at Tenchebrai, Robert was made prisoner, and he remained in captivity until his death at Cardiff in Feb., 1134. His son, William the Clito, was at one time a claimant for the English throne.



Robert II,
Duke of Normandy

Robert the Devil. Hero of a 13th century French metrical romance. He was the son of Bertha, daughter of Robert, duke of Normandy, and of a fiend in the guise of a knight. In him is represented the struggle between the dual nature of his heritage, though the human conquers. The story was used by Meyerbeer in his opera, *Robert le Diable*, 1831, for which Scribe wrote the libretto.

Robertson, Sir Hugh S. (b. 1874). Scottish musician. He was born and educated in Glasgow, and there in 1906 founded the celebrated Glasgow Orpheus choir, for which he arranged part songs and composed others, as well as conducting. Knighted in 1931, Sir Hugh was president of the Curwen Memorial College from 1944. He was an ardent pacifist.

Roberts, Frederick Sleigh **Roberts, Earl** (1831-1914). British soldier. Born at Cawnpore, Sept. 30, 1832, he was educated at Eton, Sandhurst, and Addiscombe, and received his first commission in the R.A. in 1851. After acting for a year as aide-de-camp to his father, Gen. Sir Abraham Roberts, who was in command of the Peshawar district, he was appointed to the horse artillery,

and in 1856 to the quartermaster-general's branch of the staff. On the outbreak of the Indian Mutiny, 1857, he was appointed staff officer to Chamberlain's mobile column; then in response to an appeal for artillery officers he travelled to Delhi, where he was appointed D.A.Q.M.G.



Robert Roberts

for artillery. At the end of the siege he was appointed D.A.Q.M.G. to the column sent to Cawnpore, which fought actions at Bulandshahr and Agra.

From Cawnpore, he marched with Hope Grant to the Alum-Bagh. Sir Colin Campbell, then commanding the second expedition for the relief of Lucknow, entrusted him with several dangerous missions, and when the column fought its way into Lucknow, it was Roberts who hoisted the British flag three times over the mess-house. After Lucknow he was present at the defeat of a band of mutineers at Khudaganj, Dec., 1857, and in the pursuit after this action won the V.C. by saving the life of a sowar and rescuing a standard from two sepoys. In March, 1858, he returned to England on sick leave.

Kabul and Kandahar

Returning to service, he was engaged in the Umbeyla expedition of 1863, the Abyssinian expedition of 1867, and the Lushai expedition of 1871. In 1875 he became Q.M.G. of the Indian army, and in 1878 commander of the Punjab Frontier Force. War with Afghanistan followed shortly after this, and Roberts, commanding the Kurram Field Force, defeated the Afghans at the Peiwar Kotal. After the murder of the British agent at Kabul in 1879, he invaded Afghanistan by the Shutargardan Pass, defeated the Afghans at Charasia, and entered Kabul, Oct. 7. In July, 1880, the British force at Kandahar suffered a disastrous defeat, and on Aug. 9, Roberts set out from Kabul with 10,000 troops, reaching Kandahar on Sept. 1, and defeating the Afghan army next day.

After a year in England, he was appointed c.-in.-c. at Madras, and in 1885 he became c.-in.-c. in India. During the next eight years he reorganized the defence of the N.W. Frontier, strengthened the army, and greatly improved

its efficiency. In 1895 he was appointed c.-in-c. in Ireland. In Dec., 1899, after the early British defeats of the S. African war, he was appointed to the command of the British army in S. Africa, and immediately altered the whole course of the campaign, defeating Cronje at Paardeberg and marching across the Free State to Bloemfontein, and then to Johannesburg and Pretoria. He returned home in Sept., 1900, leaving Kitchener in command.

In Jan., 1901, Roberts, now created Earl Roberts of Kandahar, and a field-marshal, became c.-in-c. of the British army until that office was abolished in 1904, when he was retired. He then became president of the National Service League, devoting himself to warning his countrymen of the coming European struggle. When it came in 1914, he was anxious to encourage by his presence among them the Indian contingent sent to fight in France, and visited their h.q. there in Nov. He caught a chill, and died Nov. 14, being buried in S. Paul's cathedral.

Roberts, known everywhere by his nickname "Bobs," had a short, well-knit figure, and a piercing eye. His courage and coolness in danger were joined to an intuitive power of divining the effect of his own moves on the enemy. After his death, his daughter, Aileen (1870-1944), became Countess Roberts by special remainder. His only son, Frederick H. S. Roberts, an artillery lieutenant, fatally wounded at Colenso, Dec. 15, 1899, in an attempt to save some guns, was posthumously awarded the V.C.

Bibliography. Roberts's own books: *Forty-one Years in India*, 1897; *Speeches and Letters on Imperial Defence*, 1906; *Lives by C. R. Low*, 1883; *W. Jerrold*, 1900; *W. E. Cairns*, 1902; *Sir G. Forrest*, 1914; *H. de Watterville*, 1938.

Roberts, ARTHUR (1852-1933). British comedian. Born Sept. 21, 1852, he made his first stage appearance as comedian, raconteur, and mimic 1878, though he had performed on Yarmouth sands at the age of eight. He was successful on the music-hall, but from 1883 he made a new reputation in some early musical comedies and in burlesque opera. He returned to the music-halls for a time in 1904, and appeared at



Arthur Roberts,
British comedian

the age of 80 with the *Veterans of Variety*. He was said to have invented the phrase "near the knuckle" to describe his own style of wit. He wrote *The Adventures of Arthur Roberts*, 1895, and *Fifty Years of Spoof*, 1927. He died Feb. 27, 1933.

Roberts, SIR CHARLES GEORGE DOUGLAS (1860-1943). Canadian writer. Born near Fredericton, New Brunswick, Jan. 10, 1860, he was educated at New Brunswick university, and became a schoolmaster, later achieving distinction as a journalist. From 1885 to 1895 he was professor at King's College, Nova Scotia. A prolific writer of verse, essays, and novels, he was best known for his tales of Canadian wild animal life. He served in the First Great War. He was acclaimed as an outstanding poet and as the "father of Canadian literature," having published his first volume of poems in 1880. Roberts, knighted in 1935, died at Toronto, Nov. 27, 1943. *Consult Life*, E. M. Pomeroy, 1943.

Roberts, DAVID (1796-1864). Scottish painter. Born at Stockbridge, Edinburgh, Oct. 24, 1796,



David Roberts,
Scottish painter

he worked under a house-painter, and began his career by scene painting. Later he painted picturesque buildings and landscapes in England, Normandy, Italy, Spain, and the Holy Land, and published volumes of drawings of Eastern subjects, becoming a very popular artist. He was elected A.R.A. in 1839, R.A. in 1841, and died in London, Nov. 25, 1864.

Roberts, GEORGE HENRY (1869-1928). British politician. Born at Chedgrave, Norfolk, he entered the



G. H. Roberts,
British politician

printing trade, and became organizer of the Typographical Association and president of the Trade Council, Norwich. Joining the I.L.P. in 1886, he was returned as Labour M.P. for Norwich in 1906. Appointed a lord commissioner of the treasury, he was parliamentary secretary to the board of trade, minister of labour, 1917-18, and food controller, Jan., 1919, to Feb., 1920. He died April 25, 1928.

Roberts, JOHN (d. 1880). British billiards player. He was born at Liverpool, and in 1844 became marker at Oldham. In 1849 he challenged Jonathan Kentfield, and assumed the title of champion when Kentfield refused to play him. He introduced spot-stroke play; and in March, 1862, made the then record break of 346, which included 55 spot hazards. He held the championship until defeated by his pupil, W. Cook, at St. James's Hall, London, Feb. 11, 1870. Roberts continued playing in matches and tournaments for some years; afterwards he retired to Manchester. He died in London in 1880.



John Roberts, jun.,
British billiards
player

Hisson, John Roberts, jun. (1847-1919), was born at Manchester, Aug. 15, 1847. For many years he was the most accomplished and attractive billiards player in the world, his open and all round methods being delightful to watch. When playing against E. Diggle, on May 3-4, 1894, he compiled a magnificent spot-barred break of 1,392. Roberts won the professional billiards championship in 1870, against Cook, holding the title against him in 1875, 1877, and 1885, and beat C. Dawson, 18,000 up level, by 1,814, for £200 and the championship in 1899. He travelled widely, visiting India, Australia, Canada, the U.S.A., and died at Worthing, Dec. 23, 1919. *Consult Modern Billiards*, with an autobiography of Roberts, 1902.

Roberts, MORLEY (1857-1942). British writer. Born in London, Dec. 29, 1857, he was educated at Bedford school, and Owens College, Manchester. At 19 he went to Australia, working on railways in Victoria, and later moved on to Canada, where he took part in the building of the C.P.R.

His first book, *The Western Avernus*, was published in 1887, but he found success with *Rachael Marr*, 1903, which drew the praises of W. H. Hudson. Other novels included *Time* and *Thomas Waring*, 1914; *Hearts of Women*, 1919. On the Earthquake Line,



Morley Roberts,
British writer

1924, and *Tales of Changing Seas*, 1927, were notable tales of adventure. Later works included *Bio-Politics*, 1938, and *The Behaviour of Nations*, 1941—books which advanced his sociological theories. He also wrote a life of W. H. Hudson in 1924. He died June 8, 1942.

Roberts, William (b. 1895). British painter. After studying at the Slade school, he became a member of the London Group. Early influenced by Wyndham Lewis's Vorticism, he evolved a sombre, highly individual style notable for its caustic observation of brutal types. He exhibited regularly in London, holding one-man shows at the Redfern and Leicester galleries. He is represented at the Tate Gallery, the Imperial War Museum, and the National Gallery of Canada.

Robertson, James Patrick Bannerman Robertson, Baron (1845–1909). Scottish lawyer. Born at Forteviot, the son of a minister, he was educated at Edinburgh high school and university. In 1867 he became an advocate, and soon came to the front, his gifts including a logical mind, a wide knowledge of law, and a mordant wit. Conservative in politics, he was M.P. for Buteshire, 1885–91; solicitor-general for Scotland, 1885–86 and 1886–88; and lord advocate, 1888–91. From 1891 he was president of the court of session, and in 1899 he was made a law lord and a life peer, as Baron Robertson of Forteviot. He died Feb. 1, 1909.

Robertson, Sir Brian Hubert (b. 1896). British soldier. Son of Sir William Robertson (whom he succeeded as 2nd baronet in 1933), he was born July 22, 1896, and educated at Charterhouse and the R.M.A., Woolwich. In the First Great War he was awarded the D.S.O.; he took part in the Waziristan expedition of 1922; and retired in 1933, to become managing director of Dunlop, South Africa, Ltd. Robertson came back to serve in the Middle East, 1941–43, and was chief administrative officer to Alexander, c.-in-c. Italy, 1944–45. General Robertson was deputy mil. gov., 1945–47, and mil. gov., 1947–49, of the British zone of occupation in Germany, then high commissioner until June, 1950, when he was made c.-in-c. Middle East land forces.

Robertson, Sir Charles Grant (1869–1948). British historian. From Highgate school he went to a brilliant career at

Hertford College, Oxford, and remained at the university until 1920, being domestic bursar of All Souls from 1897 and also senior history tutor at Magdalen from 1905. Books such as *The Rise of the English Nation*, 1895; *England Under the Hanoverians*, 1911; *Bismarck*, 1918, became authoritative works, but it was rather his gifts as teacher and administrator that led to Robertson's appointment as principal of Birmingham university in 1920. He remained 18 years and from 1927 was also vice-chancellor. In 1928 he was knighted. During the Second Great War he went back to All Souls as domestic bursar, and in 1946 published a study of Chatham and the British Empire. On Feb. 29, 1948, he died at Ringwood.

Robertson, Frederick William (1816–53). British divine. He was born in London, Feb. 3, 1816, and was articled in 1834 to a solicitor at Bury St. Edmunds. Disliking this, he studied for the army, but later entered Brasenose College, Oxford. In 1840 he was ordained in the Church of England, and became a curate at Winchester and then at Cheltenham. In 1847 he was appointed incumbent of a proprietary chapel at Brighton, and there he remained until his death, Aug. 15, 1853, the result of disease of the brain. In a few years Robertson made himself one of the most influential preachers of the 19th century, and his sermons are among the few that rank as literature. His views are generally described as broad church, but his sympathies were too wide for such classification. See *Preaching. Consult Sermons*, 1855; *Addresses*, 1858; *Life and Letters*, S. A. Brooke, 1865.

Robertson, John Mackinnon (1856–1933). British writer and politician. Born at Brodick, Arran, Nov. 14, 1856, he was educated at Stirling, but left school at 13. Associated with Bradlaugh on *The National Reformer*, which he edited, 1891–93, Robertson became a recognized authority on freethought. Entering parliament as Liberal member for Tyneside, 1906, he became parliamentary secretary to the board of trade, 1911–15, and was chairman of the committee on food supply in 1916. His publications include *Modern Humanists*, 1895; *Montaigne and Shakespeare*, 1897; *The Baconian Heresy*, 1913; *The Shakespeare Canon*; *Short History of Freethought*, rev. ed. 1935. Command of detail and

deep knowledge helped him to overcome the handicap of a somewhat turgid style. He died Jan. 5, 1933.

Robertson, Thomas William (1829–71). British dramatist. Born at Newark-upon-Trent, Jan.



T. W. Robertson,
British dramatist

9, 1829, he began as an actor, tried journalism, was rejected for the army, and had written several dramas before he achieved success with *David Garrick*, 1864. His other plays include *Society*, 1865; *Ours*, 1866; *Caste*, 1867; and *School*, 1869. *Caste*, his best known piece, was originally produced by the Bancrofts at the Prince of Wales's Theatre, London, and has been many times revived. Tom Robertson created lifelike characters, and his plays reflect accurately the manners of his time. He died Feb. 3, 1871. *Consult Life and Writings*, T. E. Pemberton, 1893.

Robertson, William (1721–93). Scottish historian. Born in Midlothian, Sept. 19, 1721, and educated at Edinburgh university, he entered the ministry of the Church of Scotland, holding charges in E. Lothian, and Edinburgh. In 1759 appeared his *History of Scotland*, an immediate success, which led to his being appointed principal of Edinburgh university and historiographer royal for Scotland. Other books, *A History of Charles V*, 1769, *A History of America*, 1777, brought great financial reward; for the former he received £4,500. Modern research has impaired the value of much of Robertson's work, notably in the *History of Scotland*, yet he will always be read for his wonderful narrative powers and his eloquent treatment of great events. Reading his works awakened Carlyle's interest in history. Robertson died June 11, 1793. *Consult Life*, D. Stewart, 1801.



William Robertson,
Scottish historian

Robertson, Sir William Robert (1860–1933). British soldier. Born at Welbourn, Lincs, he enlisted as a private in the 16th Lancers in 1877, becoming sergeant in 1882. He showed exceptional promise and was gazetted second

lieutenant in 1888, proceeding to India to join the 3rd Dragoon Guards. He remained there until 1896, during which period he rose to staff-captain, served as intelligence officer with the Chitral relief expedition, worked in the intelligence branch at Simla, received the D.S.O., and mastered Hindustani, Persian, and Pushtu. In 1896 he entered the staff college at Camberley, the first ranker to do so, and on passing out in 1898 joined the intelligence division at the War office. In the S. African War he served on the staff and took part in various battles. From 1902 to 1907 he was again at the War office (intelligence), then served as chief of staff, Aldershot. In 1910 he was appointed commandant of the staff college, Camberley, and in 1913 director of military training at the War office.



Sir W. Robertson,
British soldier

Robertson went to France in Aug., 1914, as Q.M.G. of the expeditionary force, and was chief of staff next year. In Dec., 1915, he went to the War office as chief of the imperial general staff. After Kitchener's death, Robertson was in supreme direction of British military operations on all fronts. Greater as an organizer than as a strategist, he preferred a war of attrition to spectacular strokes, but the government and people gradually lost confidence in him, and he resigned early in 1918. He next held the Eastern command, and in 1919-20 was commander-in-chief of the British Rhine forces. For his war services Robertson, who had been knighted in 1913, was made a baronet and received £10,000 in 1919. Promoted major-general 1910, lieutenant-general 1915, general 1916, he was created field marshal in 1920, the first soldier in the British army to rise from private to the highest rank. He published in 1921 his autobiography, *From Private to Field-Marshal*; his *Life* had been written by G. A. Leask, 1917. He died Feb. 12, 1933. His son, Sir Brian, is noticed separately.

Robertson-Scott, J. W. (b. 1866). British author and editor. He was born at Wigton, Cumberland, and educated at Quaker schools. Starting journalism with the *Birmingham Daily Gazette* at the age of 20, he was later on the staff of various London journals,

and then became a specialist writer on countryside subjects. In 1910 he was rural commissioner for the *Daily Chronicle* in the Netherlands and Denmark, and in 1915 he founded and edited the *Near East*, a magazine published in English and Japanese in Tokyo. In 1927 he founded *The Countryman*, and for 20 years edited what became one of the most remarkable and successful journalistic enterprises of its day. He wrote widely on the Far East and on the English countryside, his best-known book being *England's Green and Pleasant Land*, 1925. *Faith and Works in Fleet Street* appeared 1947.

Robes, GROOM OF THE. Honorary official of the British royal household. The holder, usually a retired officer, has care of the king's state uniforms.

Robes, MISTRESS OF THE. Official of the British royal household. Senior lady of the queen's household, the mistress of the robes attends her on all state occasions. Invariably a duchess, she does not reside at the palace. With a queen regnant, the appointment is political and ceases with the ministry.

Robeson, PAUL LE ROY (b. 1898). American actor and singer. A negro, he was born at Princetown, N.J., April 9, 1898, and educated at Columbia university, where he graduated in law. Abandoning a legal career, he went on the stage, first appearing in New York in 1921, and acting with Mrs. Patrick Campbell in *The Voodoo at Blackpool* in 1922. In New York he made a sensation when he appeared in O'Neill's *All God's Chillun Got Wings*, 1924, and *The Emperor Jones*, 1925, achieving success the same year in the latter play in London. In 1928 he gave a brilliant performance in the musical play *Show Boat* at Drury



Paul Robeson,
American singer



J. W. Robertson-
Scott,
British editor

Lane. As a concert singer, his rich bass voice and memorable interpretations of negro spirituals also brought him fame. He appeared as Othello in the U.S.A., during 1942-44, a performance considered the finest of his career. Robeson entered films in 1933, and played in screen versions of *Show Boat*, *The Emperor Jones*, and *Sanders of the River*. A biography, by his wife, appeared in 1930.

Robeson Channel. Strait separating N.W. Greenland from N.E. Ellesmere Island, Arctic America. It connects Hall Basin on the S. with Lincoln Sea on the N. It is 50 m. long, and its width varies between 11 m. and 24 m. It is blocked with ice nearly all the year round, but Peary succeeded in taking a ship through the channel in both directions. See *Arctic Exploration*.



Robespierre

Robespierre, MAXIMILIEN MARIE ISIDORE (1758-94). French revolutionist. Born at Arras, May 6, 1758, he became an attorney at his native place, and was one of the representatives of the Third Estate, when the States-General was

assembled in France on May 5, 1789. Fixed convictions, extreme zeal, and an ostentatious disinterestedness, joined with an enormous egoism and some talent as an orator, soon made him prominent among the extremists, with whom the Jacobin Club presently became identified.

It was on his proposal that the Constituent Assembly passed the self-denying ordinance which excluded its members from its successor, the Legislative Assembly, 1791. It was therefore as a member of the Jacobin Club, not of the Assembly, that Robespierre continued to lead the extreme faction in association with Marat and Danton. He was, however, again elected to the National Convention which met at the end of Sept., 1792, and proclaimed the French Republic. He had already brought about the creation of the Revolutionary Tribunal.

In the Convention Robespierre was at first, with Danton, leader of the extreme section known as the Mountain, who after the execution of the king, Jan. 21, 1793, entered upon their victorious struggle with the Girondists. Elected, July, 1793, to the recently appointed committee of public

safety, which was to all intents and purposes a commission endowed with absolute powers for the government of France, Robespierre was the person most responsible for the Reign of Terror, and after the execution of Desmoulins, and Danton, April 5, 1794, he became in effect dictator.

But the Terror grew intolerable; France recoiled, surfeited with the orgy of blood, a conspiracy was organized, the blow was secretly and thoroughly prepared, and on July 27 Robespierre was suddenly and vehemently denounced in the Convention. The crash was complete. Robespierre and his most intimate allies fled, but were arrested, and next day, July 28, the head of him whom Carlyle called the "Seagreen incorruptible" fell under the guillotine. See French Revolution; Jacobins. Consult The French Revolution, T. Carlyle, 1837; Histoire de R. d'après des papiers de famille, 1865-67; Lives, H. Belloc, 1901; J. M. Thompson, 1935; G. J. Renier, 1936; R. Korngold, 1937; F. Silburg, Eng. trans. 1937.

Robey, GEORGE (b. 1869). British comedian. Born George Edward Wade, Sept. 20, 1869, he made his first stage appearance on the music-hall stage in 1891. After playing at the chief London music-halls he appeared at every variety theatre of note throughout Great Britain, making his first



George Robey,
British comedian

appearance in pantomime at Brighton. His quips and innuendoes, his bowler hat, interrogative eyebrows, red nose, and battered umbrella, all contributed to make him one of the most famous comedians. He introduced many popular patter songs. He first appeared in revue at the Alhambra, London, in The Bing Boys Are Here, 1916, and he was the star of many subsequent revues at the Alhambra, Hippodrome, and elsewhere. He also gave outstanding performances as Menelaus in Helen I, 1932, and as Falstaff in Shakespeare's Henry IV (Part I) at His Majesty's, 1935. He was for many years a member of the B.B.C.'s general advisory council. His most memorable performance in films was as Sancho Panza in Pabst's Don Quixote. On many occasions Robey was outspoken in defence of what he called "honest vulgarity." He published My Life up to Now, 1908;

Mental Fireworks, 1925; Looking Back on Life, 1933. Among his hobbies were painting and the making of violins, of which instrument he was a connoisseur. His son, Edward George Robey (b. 1900), was senior legal assistant to the director of public prosecutions.

Robin (*Erithacus rubecula*).



Robin or Redbreast
W. S. Berridge, F.Z.S.

Songbird of the thrush family. Often called the robin redbreast, it is a native of Europe, W. Asia, and across Africa to the Canaries and Azores. In Britain, owing to its associations in legend and literature and its familiarity, it is probably the most popular bird. The bright red forehead, face, and breast separated by a blue-grey line from the greenish-brown of the upper parts, make it distinct from all other British birds. Its full bright black eye and long legs are other prominent features. These sexes are alike in colour.

In open country the robin nests usually in a hole in a grassy bank or ditch-side; but near houses it shows a fondness for utilising discarded boots, cans, kettles, and flower-pots for this purpose. Grass, moss, and dead leaves are its materials, the lining of hair or feathers.

There are from five to seven eggs of a buffy-white freckled with pale red, and there may be two or three batches in the year. The food consists mainly of insects, worms, and spiders, occasional berries, and in winter household scraps. The robin is a notorious fighter with his own kind when they trespass upon his special territory. The sweet but limited song may be heard at all seasons. Many of the birds migrate in autumn. See Eggs colour plate. Consult The Life of the Robin, D. Lack, 1943.

Robin Goodfellow. English name of a familiar, mischievous fairy who has now come to be better known as Puck (q.v.). The Mad Pranks and Merry Jest of Robin Goodfellow were set forth in a black-letter tract of 1628.

Robin Hood. Central figure in romantic stories told in old English ballads and songs of a robber outlaw, head of a band which dwelt in Sherwood Forest. He was a famous bowman, and robbed the rich that he might give to the poor, and is variously said to have been a goodly yeoman and a certain Robert who claimed to be earl of Huntingdon. Whether there is any historical basis for the legends is a matter of dispute. The ballads and poems concerning Robin Hood were collected by Joseph Ritson in 1795, and have been published in many forms. The outlaw is introduced into Scott's Ivanhoe as Locksley, and on this account he is supposed to have been born at Loxley in Staffordshire. His story was told in such poetic plays as Tennyson's The Foresters, 1891, and Alfred Noyes's Sherwood, 1911. See Little John; Maid Marian; Quarter-staff; Sherwood.

Robin Hood's Bay. Watering-place of the N. Riding of Yorks, England. It stands at the N. end of Robin Hood's Bay, an opening



Robin Hood's Bay, Yorkshire. Looking across the old village towards the bay

of the North Sea, 6½ m. S.E. of Whitby, with a rly. station. Known also as Bay Town, it consists of an old fishing village on the cliffs, and modern houses inland. It has a fine 19th century church. According to legend, Robin Hood sought refuge at Fylingdales, near here.

Robinson, AGNES MARY FRANCES (1857-1944). British writer. She was born at Leamington, Feb. 27, 1857, and published books of verse (Collected Poems, 1901), as well as biographical studies of Emily Brontë, Margaret of Angoulême, Mme. de Sévigné, Ernest Renan, and Racine. She married James Darmesteter (q.v.), and, after his death, Emile Duclaux, director of the Pasteur Inst., Paris. She died Feb. 9, 1944.

Robinson, EDWARD G. (b. 1893). An American film actor. Emanuel Goldenberg was born in

Bukarest, of Jewish family, Dec. 12, 1893. He went to the U.S.A. at nine, attended Columbia university, N.Y., being a remarkable linguist, and was in the navy in the First Great War. From the stage he went into films with The Bright Shawl, 1923. Five Star Final, 1932, brought him to the fore, and he specialised in criminal types but always made them sympathetic. His later films included The Honourable Mr. Wong, 1932; Two Seconds, 1933; Barbary Coast, 1936; The Amazing Dr. Clitterhouse, 1939; This Man Reuter, 1941; The Woman at the Window, 1945. In England in 1948 he made Thunder in the City.

Robinson, HENRY CRABB (1775-1867). British journalist and diarist. Born at Bury St. Edmunds,



Crabb Robinson,
British journalist

March 13, 1775, and educated at private schools, he was articled to an attorney. He gave up the law on inheriting money, and travelled abroad, meeting Goethe and Schiller at Weimar, and

studying for a time at the university of Jena. He became correspondent of The Times at Altona, then foreign editor, and subsequently represented his paper during the Peninsular War. In 1813 he was called to the bar, and practised for 13 years. He was a conversationalist of the first order, and his breakfasts became famous. Robinson's great tribute to posterity is to be found in his Diary and Correspondence, of which selections were edited and published by Sadler, 1869. Robinson died in London, Feb. 5, 1867. See Dandies and Men of Letters, L. H. Vincent, 1913.

Robinson, JOHN (c. 1576-1625). English Puritan. Born probably in Nottinghamshire, he was educated at Cambridge, most likely at Corpus Christi College. Having been ordained, he worked in Norwich, but his Puritan opinions brought him into disfavour. He joined the separatists and preached to them at Gainsborough, and then at Scrooby, and in 1608, to escape persecution, he went to Amsterdam. In 1609 he became pastor of a church at Leyden, where he formed the idea of a Puritan colony in America. In 1620, largely owing to his efforts, the Pilgrim Fathers set sail, but Robinson himself never crossed to them. He died at Leyden, March 1, 1625.

Robinson is regarded as one of the founders of Congregationalism. His name is perpetuated by the Congregational church at Gainsborough, and his numerous theological works were reprinted in 1851. See Congregationalism; Pilgrim Fathers; consult John Robinson, O. S. Davis, 1903.

Robinson, LENNOX (b. 1886). Irish dramatist. Born at Douglas, Cork, Oct. 4, 1886, he was educated at Bandon grammar school. For a time he was dramatic critic to The Observer, resigning in 1925. Having lectured on the drama at the universities of Michigan and Montana and at the Carnegie Institute, Pittsburgh, U.S.A., he became a director of the Abbey Theatre, Dublin, at which most of his plays were produced. These were notable for humour and lyrical beauty. The White-Headed Boy (1916) ran for 290 performances at the Ambassadors Theatre, London, in 1920, and has been revived. Other plays included The Big House, 1926; The Far-Off Hills, 1928; Drama at Innish, 1933; Bird's Nest, 1938. Robinson's autobiography, Curtain Up, was pub. in 1942, and he edited the letters of Lady Gregory, 1946.

Robinson, MARY (1758-1800). English actress and royal favourite. Born at Bristol, Nov. 27, 1758,



Mary Robinson,
English actress

she came to London, and having received tuition from Garrick, made her first appearance as Juliet at Drury Lane, Dec. 10, 1776. On Dec. 3, 1778, she appeared as Perdita in Garrick's adaptation of The Winter's Tale, and captured the affections of the prince of Wales, afterwards George IV, who quickly tired of her. She was subsequently the mistress of C. J. Fox, and of Colonel Tarleton, and her portrait was painted by Reynolds, Gainsborough, Romney, Cosway, and Hoppner; but she died in poverty, Dec. 26, 1800.

Robinson, SIR ROBERT (b. 1886). British chemist. He was born Sept. 13, 1886, at Chesterfield, and educated at Fulneck school and Manchester university.



Lennox Robinson,
Irish dramatist

During 1912-15 he was professor of chemistry at the university of Sydney, returning to Great Britain to take over the professorship of organic chemistry at Liverpool. In 1920 he became director of research to the British Dyestuffs Federation, but the following year was professor of chemistry at St. Andrews. He occupied successively chairs in that subject at Manchester, London, and Oxford, the last from 1930. In 1939 he was knighted and in 1949 made O.M. The Nobel prize for chemistry in 1947 was a recognition of his research work in the organic field.

Robinson, SIR THOMAS (1698-1770). British politician. The son of a Yorkshire baronet, he was educated at Trinity College, Cambridge. He was ambassador at Vienna, 1730-48. In 1754, being then an M.P., he was made secretary of state and leader of the commons under the duke of Newcastle, but resigned in 1755. In 1761 he was made Baron Grantham, and he died Sept. 30, 1770.

His grandson Thomas Philip, 3rd baron (1781-1859), became Earl de Grey and was first lord of the Admiralty, 1834-35, and lord-lieutenant of Ireland, 1841-44. On his death his titles, including the barony of Grantham, passed to his nephew, who became the marquess of Ripon (q.v.).

Robinson, WILLIAM HEATH (1872-1944). British artist and illustrator. Born at Islington, May 31, 1872, he

studied at the R.A. schools. As a book illustrator in colour and in black-and-white, he displayed a strongly marked decorative sense, and among his illustrations



W. Heath Robinson,
British artist

were those for Don Quixote, Arabian Nights, Twelfth Night, The Water Babies, and Kipling's collected verse. He was more widely known by humorous drawings distinguished by their crazy inventiveness; especially the ludicrously elaborate mechanical devices for equally ludicrous purposes, which made his name a household word when speaking of "gadgets" (such as that for putting mites into cheese) that were more ingenious than effective. His drawings were frequently collected in volume form, and in 1934 he published Absurdities. He died Sept. 13, 1944. Consult Life, L. Dav. 1947.

Robinson, WILLIAM LEEFE (1895-1918). British airman. Born in India, July 14, 1895, he was commissioned from Sandhurst in 1914 and joined the R.F.C. the next year. On the occasion of the Zeppelin raid on London, Sept. 3, 1916, Robinson attacked one ship, and after two hours aloft attacked another, bringing her down in flames at Cuffley. For this he received the V.C. In May, 1917, he was brought down at Douai and made a prisoner. He died at Stanmore, Dec. 31, 1918.

Robinson Crusoe. Novel by Defoe. The first part was published April 25, 1719, with the full title of *The Life and Strange Surprising Adventures of Robinson Crusoe of York, Mariner; who lived Eight-and-Twenty Years all alone in an Uninhabited Island on the coast*



Robinson Crusoe. An artist's representation of the hero of Defoe's novel of the same name

of America, near the mouth of the great River of Orinoco: Having been cast on Shore by Shipwreck wherein all the Men perished but himself: With an account how he was at last as strangely delivered by Pirates. Written by himself. The second part was published four months later. The story achieved instant popularity, and the first part has taken its place as a classic among adventure stories. It is supposed to have been founded on the experiences of Alexander Selkirk (*q.v.*), who had lived alone on the island of Juan Fernandez for four years and returned to England in 1711. See Defoe.

Robot (Czech *robot*, work). Automatic machine that does work ordinarily performed by a man. The word passed into popular usage in many countries to describe either mechanical devices, or workers who, by performing mechanical or repetitive work, became

almost machines themselves, after the production of Karel Capek's play, *R.U.R.* (Rossum's Universal Robots), in 1923. In *R.U.R.*, society is represented as dependent on mechanical workers called robots, which can perform any kind of mental or physical work, and when worn out are scrapped and replaced. But they develop intelligence and eventually exterminate their creators.

Electrically controlled robots have been constructed to perform specific functions in response to properly worded commands. Most of them incorporate a microphone which, upon receiving the correct sonic inflection, operates relays that move the robot's arms, legs, and head, and causes a steel recording tape to answer questions. The great brass brain, in Washington, D.C., gives, when asked, the date and time, and predicts the tides for every port in the world for years ahead. Eric, first exhibited in New York in 1925, was a mechanical man of stainless steel capable of rising to its feet, bowing, shaking hands, and answering questions. The robot principle has been applied to automatic telephone exchanges, artillery predictors, flue gas analysing machines, underground rly. signals, and vehicle-actuated traffic lights. See *Automatic Machines*; *Automatic Pilot*; *Automaton*; *Calculating Machine*; *Photo-electric Cell*; *Radio Control*; *Remote Control*.

Rob Roy (Gael., red Robert). Popular name for Robert MacGregor (1671-1734), Highland robber. Son of a freebooter, he was brought up at Balquhider and early made a name for himself by his daring exploits and cattle-stealing raids. To avoid the penal Acts revived in 1693 against the MacGregor clan, he assumed the name of Campbell. In the rising of 1715 Rob Roy played no important part, but after the battle of Sheriffmuir he made various raids on the S. and W. and became a scourge to the country until captured. He soon escaped and passed the succeeding years as a fugitive until his pardon in 1727, after which he settled in Balquhider, where he died Dec. 28, 1734. Consult *Historical Memoirs of Rob Roy*, K. Macleay, new ed. 1881; *Story of Rob Roy*, A. H. Millar, 1883.

Rob Roy. Sixth of the Waverley novels, published Dec., 1817. Its hero is the famous robber chief of the MacGregors, who is represented as a Jacobite involved in the 1715 rebellion, and as render-

ing valuable aid to Frank Osbaldistone, who tells the story. The Highland adventures stand out prominently, while the characters of Di Vernon, Bailie Nicol Jarvie, and the Osbaldistone family are notable. The novel, first dramatized in 1818, has formed the basis of several plays and operas.

Rob Roy. Type of canoe first built and used by John Macgregor, known as Rob Roy. From 12 to 15 ft. long, such canoes weigh about 70 lb. See *Canoe*.

Robsart, Amy (c. 1532-60). The daughter of Sir John Robsart of Siderstern, Norfolk, she married Robert Dudley, afterwards earl of Leicester (*q.v.*), at Sheen, June 4, 1550. The marriage was childless, and Dudley appears to have neglected her, though they remained outwardly on good terms. In 1560 Amy went to Cumnor Place, Berkshire, near Oxford, a house belonging to her husband, and on Sept. 8 was found at the foot of the stairs with her neck broken. The coroner's jury assigned her death to mischance, but suspicion at once fell on Dudley. (Consult Amy Robsart of Wymon Lane, Sir B. H. T. Frere, 1937.)

She appears as the heroine of Scott's novel *Kenilworth*. Betrothed to Edmund Tressilian, she is secretly married to the earl of Leicester, who keeps her prisoner at Cumnor Place, whence, to escape from the unwelcome attentions of Richard Varney, she flees to Kenilworth Castle, where Varney poses before the queen as her husband. Amy's letter of explanation to Leicester is delayed, and she falls through a trap-door at Cumnor as she is hastening, misled by Varney's imitation of the earl's whistle, to meet her husband.

Robson, FLORA (b. 1902). British actress. Born at South Shields, March 28, 1902, she studied at the R.A.D.A., making her first professional appearance in *Will Shakespeare*, 1921. After appearing in plays of all types, e.g. O'Neill's *Desire*



Flora Robson, British actress

Under the Elms, Bridie's *The Anatomist*, and Priestley's *Dangerous Corner*, she joined the Old Vic company in 1933, and established her reputation as an actress of great emotional power in *Shakespeare*, *Congreve* and *Chekhov*. The brooding intensity with which she

invested certain characters was especially memorable: in *Mary Tudor*, 1935; *Guilty* (a version of Zola's *Thérèse Raquin*), 1944; *Black Chiffon*, 1949. She acted in films, e.g. *Fire Over England*, 1937; *Wuthering Heights*, 1939; *Poison Pen*, 1940; *Caesar and Cleopatra*, 1946; *Black Narcissus*, 1947.

Robson, THOMAS FREDERICK (1822-64). Stage name of Thomas Robson Brownhill, British actor.



T. F. Robson,
British actor

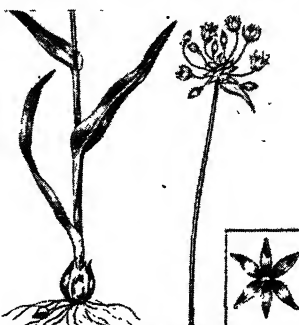
Born at Margate, he started life as a copper-plate engraver, and after some years in obscure theatres acquired, in 1852, a reputation for burlesque at the Olympic Theatre, London, in *Frank Talfourd's* travesties of *Macbeth* and *Shylock*. In August, 1857, he undertook the management of the theatre, appearing with great success in such domestic dramas as *The Porter's Knot*, 1858, and *The Chimney Corner*, 1861. Robson excelled in the humour that verges on pathos, and in grotesque parts he was seldom surpassed. He died Aug. 12, 1864.

Robson Peak. Mt. in the Canadian Rockies. It is on the border between Alberta and British Columbia to the N.W. of Jasper Forest Park and the Yellowhead Pass, both of which are traversed by the C.N. rly. Alt. 12,972 ft.

Roburite. Ammonium nitrate, permitted explosive. Several varieties have been made in England and Germany, trinitrotoluene being employed as the sensitizer. The usual English variety contains trinitrotoluene, 16 p.c.; ammonium nitrate, 61 p.c.; and sodium chloride, 23 p.c. See *Explosives*; *Permitted Explosives*.

Roby, HENRY JOHN (1830-1915). British scholar. Born at Tamworth, Aug. 12, 1830, he was educated at Bridgnorth and St. John's College, Cambridge, where he graduated as senior classic in 1853. College lecturer and tutor until 1861, he was professor of jurisprudence at University College, London, 1866-68. In the cotton industry during 1875-93, he was M.P. for Eccles, 1890-95. Roby was best known for his *Grammar of the Latin Language*, 1871-74. He died Jan. 2, 1915.

Roc (Arab. *rokh*). In Oriental legend, a bird of gigantic size. In one of the stories of *Sindbad the Sailor*, in the *Arabian Nights'*



Rocambole. Bulb, leaves, and flower head. Inset, single flower

Entertainments, it is said to feed its young with elephants. It was by tying himself to one of the legs of a roc that *Sindbad* was carried safely from the island on which he had been left, to be put down near the valley of diamonds.

Roca, JULIO ARGENTINO (1843-1914). Argentine statesman. Born in Tucuman, he fought in the war against Paraguay, 1865-70, and against the Indians nine years later. Suppressing the Buenos Aires insurrection of 1880, he was elected president of Argentina, and proved an enlightened and progressive ruler. President again, 1898-1904, he settled a dangerous frontier dispute with Chile, 1902, and on his retirement he became minister to Brazil and then to Paris. He died Oct. 18, 1914.

Rocamadour. A village of France, in the dept. of Lot. It is picturesquely situated in the ravine of Alzou, 400 ft. high, and enclosed by precipitous hills. The church of S. Amador and the chapel of the Virgin stand on the summit of a rock, and are reached by a granite staircase, which pilgrims ascend on their knees. It



Rocamadour, France. Picturesque pilgrimage resort built in the Alzou ravine

is one of the most ancient pilgrim resorts of France. A sword preserved here is said to be the famous Durandal of Roland. Pop. est. 1,000.

Rocambole OR **SAND LEEK** (*Allium scorodoprasum*). Bulbous herb of the family Liliaceae, native of Europe. It has long, narrow leaves with a central keel down the underside. The tall flower stem ends in a head of small red-purple flowers margined with white; it produces purple bulbs, which are used for the same purpose as garlic.

Roch (c. 1295-1327). French saint. He was born at Montpellier, of a noble family, and made a pilgrimage to Rome, after which he devoted himself to the care of the sick in Italy during a great pestilence. He caught the infection, but recovered and returned to France. Accused as a spy, he died in prison, Aug. 16, 1327. S. Roch, the patron of the plague-stricken, is widely venerated in S. Europe, and is commemorated by the magnificent Scuola di S. Rocco at Venice, designed 1517.

Rocha. Department of S.E. Uruguay. Facing the Atlantic Ocean, its area is 4,280 sq. m. Lead, copper, and iron are found, but the principal industry is stock-raising. Pop. 82,814. The capital, Rocha, is near Cape Polonio, and about 120 m. E.N.E. of Montevideo, with which it is connected by road and rly. Pop. est. 12,000.

Rochambeau, JEAN BAPTISTE DONATIEU DE VIMEUR, COMTE DE (1725-1807). French soldier. Born



Comte de
Rochambeau,
French soldier

at Vendôme, July 1, 1725, he served in the War of the Austrian Succession, in the Minorca Expedition, 1756, and in the Seven Years' War, and by 1780 had risen to the rank of lieutenant-general. In the same year he was sent in command of a French force of 6,000 men to assist the American colonists in the War of Independence, loyally cooperated with Washington, and played a prominent part in the operations which ended in the capitulation of Yorktown, 1781. After his return to France he threw in his lot with the Revolutionaries, and was made a marshal in 1791, but had a narrow escape of his life in the Terror in 1793. He died May 10, 1807.

Rochdale. County and mun. borough of Lancashire, England. It stands on the Roch, 11 m. N.E.



Rochdale arms

of Manchester and 196 m. by rly. N.W. of London, and is served by canal. The chief buildings are the church of S. Chad, dating mainly from the 14th century, and the Gothic town hall, built 1866-71. Others are the art gallery, public library, museum, infirmary, and various churches. There are a

A.R.S.A. in 1894, and R.S.A. in 1900. In 1900 he decorated with frescoes the banquet hall, Glasgow municipal buildings. He died March 10, 1921.

Roche, Sir Boyle (1743-1807). Irish politician. After service in the army, he sat in the Irish parliament from 1777 until the union.

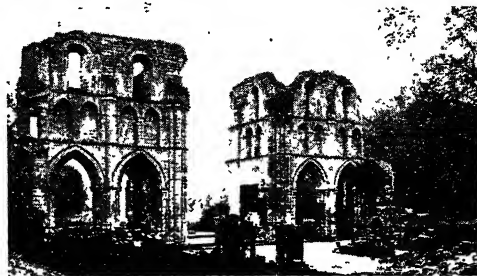


Rochdale, Lancashire. The town hall, built 1866-71. Upper picture, town centre

technical school and high schools for boys and girls. Rochdale possesses five parks and 144 acres of recreation grounds and playing fields. The industries include the manufacture of cotton goods, woollen goods, machinery, and asbestos. Important cattle markets are held, and the corporation controls a large covered market hall, with cold storage accommodation. For nearly 200 years the manor was owned by the Byron family. Rochdale is noted as the cradle of the cooperative movement and the home of John Bright. It was known for its hats and cutlery in the 16th century, but was made a borough only in 1856. It became a county borough in 1888, and from 1832 sent one member to parliament. Pop. 91,590.

Roche, Alexander Ignatius (1861-1921). Scottish painter. Born at Glasgow, Aug. 17, 1861, he studied at the local school of art, and afterwards in Paris at Julien's and the Beaux Arts. Returning to Glasgow in 1883, he settled down as a painter of landscapes with figures, modern in subject, yet tinged with romance, and in 1896 removed to Edinburgh, and developed portrait painting, though he did not abandon his former subjects. He became an

Roche Abbey. Ruins in the W. Riding of Yorks, England. They are $1\frac{1}{2}$ m. S. of Maltby, and include parts of the chancel, transepts, and gateway of a Cistercian abbey founded in 1147 as an offshoot of Fountains Abbey (*q.v.*).



Roche Abbey, Yorkshire. Ruins of the chancel and transepts of the Cistercian abbey

Rocheft-sur-Luqay, Victor Henri, Marquis de (1830-1913). French journalist and politician, generally known as Henri Rocheft. Born in Paris, Jan. 30, 1830, son of Armand de Rocheft-Luqay (1790-1871), dramatist, he was educated at the Collège St. Louis. He founded the weekly *La Lanterne*, 1868, in which he violently attacked the government of Napoleon III, and which was soon suppressed. Elected deputy,

1869, he founded *La Marseillaise*, and was imprisoned, 1870. On the fall of Napoleon, he acted for a time in the provisional govt. He resigned from the national assembly, 1871, and was transported for alleged complicity in the commune, but escaped in 1873. In 1880 he returned to France and founded

He received a baronetcy in 1782 for his support of the government, and he was a staunch upholder of the union. He died June 5, 1807. Roche acquired a great reputation for his witty speeches and delightful bulls.

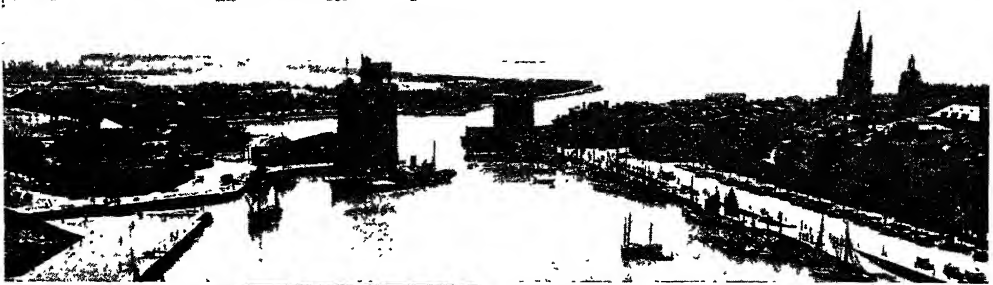
L'Intransigeant, supported Boulanger, and worked for some years in London. Returning in 1895, he attacked the Panama scandals and the pro-Dreyfus movement. Rocheft, who was unvalued in his powers of bitter invective, died at Aix-les-Bains, June 30, 1913.

Rocheft-sur-Loire. Village of France, in the dept. of Maine-et-Loire. It stands on the Loiret, not far from the Loire, and is noted for its white wines. There are the ruins of a château destroyed in 1214 by royal command, and later rebuilt. It was bought by Henry IV, who dismantled it.

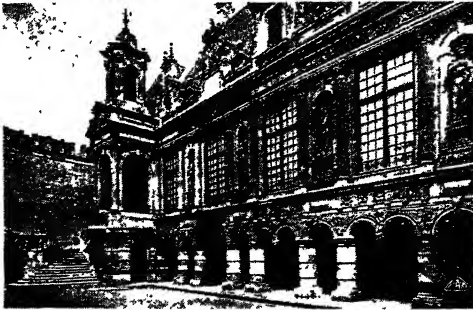
Rocheft-sur-Mer. Seaport of France, in the dept. of Charente-Inférieure. It stands on the right bank of the Charente, 9 m. from the Atlantic and 18 m. S.E. of La Rochelle. The modern and well-built town contains the Place Colbert, with an 18th century fountain, and the church of S. Louis, built 1835, noted for its stained glass. The marine hospital is one of

the best equipped in Europe. There are iron and copper foundries and machinery works, and a trade is carried on in grain, salt, brandy, wines, cattle, dairy produce, etc. The port of Rocheft was finished towards 1666, and here in 1815 Napoleon I embarked for England. Pierre Loti (*q.v.*) was a native. Pop. 29,472.

Rochelle, La. Seaport of France. The capital of the department of Charente-Supérieure, it



La Rochelle, France. The Avant-Port from the tower of S. Sauveur, showing the towers of S. Nicolas (left) and De la Chaine. Left, Hôtel de Ville



lies 90 m. S. by E. of Nantes, on the rly. to Bordeaux. The town is surrounded by ancient fortifications; three towers face the sea, of which two date from the 14th century. The cathedral, in Grecian style, was completed in 1762. Lying on the Atlantic coast, and sheltered by the two islands of Ré and Oléron, La Rochelle



La Rochelle arms

has a good harbour, but it is inaccessible to the largest vessels, which use the neighbouring port of La Pallice. La Rochelle became prominent as a port in the 12th century, and was a centre of Protestantism in France from the 16th century, being the chief centre of commerce with the French colony of Canada. It resisted the siege of the duke of Anjou, 1573, and was besieged by Richelieu in 1627, surrendering after great privation, Oct. 28, 1628. It still has a busy shipping trade, and its industries include shipbuilding, sawmills, chemical manufacture, and fisheries.

La Rochelle was entered by German forces on June 23, 1940, and as a U-boat base was frequently bombed by Allied aircraft during the Second Great War. The port remained in German occupation until May 9, 1945, when the garrison surrendered following the general German surrender. Pop. 48,923.

Oberland. The summit, 6,710 ft., reached by rack rly. from Montreux, commands a splendid view over the lake of Geneva.

Roche's Limit. Critical distance between a planet and its satellite, below which the satellite will be disrupted by the unequal gravitational pull exerted on its component parts by the planet. For a satellite of the same density as the planet, Roche showed in 1848 that the limit is 2.44 times the radius of the planet. No satellite in the solar system lies within this distance, but every part of Saturn's ring system does so. It is likely, therefore, that a former satellite came too close to Saturn and was disrupted into the fragments now seen as rings.

Roches Moutonnées (Fr., sheep-shaped rocks) OR SHEEP-BACKS. Name given to humps of rock subjected to the characteristic rounding and smoothing action of glaciers or ice-sheets. They are

Rochelle Salt. Sodium potassium tartrate. It is a substance showing a large piezo-electric effect and is used in microphones.

Rochers de Naye. Mt. peak of Switzerland, in the Bernese

common in Switzerland and in glaciated parts of the British Isles. *Pron.* Rosh mootonnay.

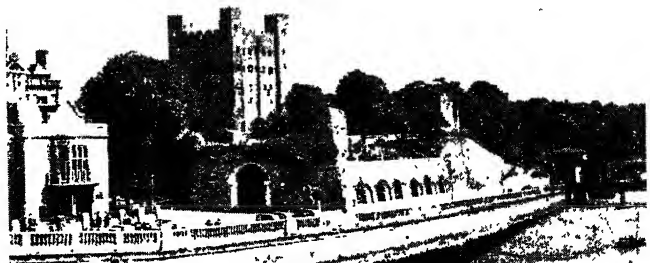
Rochester. City of Kent, England. It stands on the Medway, 8 m. from Maidstone and 28 m. by rly. S.E. of London.

The cathedral, replacing an older building, was erected in the 11th and 12th centuries, but later many additions and alterations were made. The chief features are the Norman west front, the crypt, the nave, the choir, and the tower and spire, a 20th century work. The treasures include cathedral records, tombs, and the choir stalls. Equal in interest to the cathedral is the Norman castle, one of the most complete ruins of its kind. Originally built 1097-98, the massive keep still stands. King's School has been stated to have been founded in 604. Two old houses are Eastgate House, now a museum, and Restoration House. Near are Gad's Hill Place, residence of Dickens, and the city is rich in Dickensian associations.

Rochester is a flourishing port. Both the Britons and the Romans had a settlement where Rochester stands, this being an important point on the Medway. Soon after



Rochester arms



Rochester, Kent. Remains of the Norman castle above the R. Medway

the arrival of S. Augustine, the king of Kent founded a church here and made Rochester a bishopric. Rochester's first charter dates from 1165. With Chatham it forms a bor. constituency. Pop. 41,021.

Rochester. Third largest city and a port of entry of New York, U.S.A., the co. seat of Monroe co. It stands on both banks of the Genesee river, 7 m. from its mouth in Lake Ontario, 68 m. E.N.E. of Buffalo, on the New York Central and Hudson River and other rlys. Across the river the New York State barge canal is carried by an aqueduct 848 ft. long, built in 1838. Among the buildings are the city hall and the masonic temple. Rochester is the seat of a university, and endowments by the Eastman Kodak co. have made

travelling in France and Italy, and serving in the navy against the Dutch, 1665, he settled at the court of Charles II, soon becoming known as one of the most dissolute of the king's companions. With a gift for writing delicate



2nd Earl of Rochester,
English courtier

verse of a satirical nature, his wit made him a general favourite, whilst his escapades were the talk of the town. He patronised and helped many men of letters. Worn out with debauchery, he died July 28, 1680. Many of his writings were too obscene for publication, but Ton-

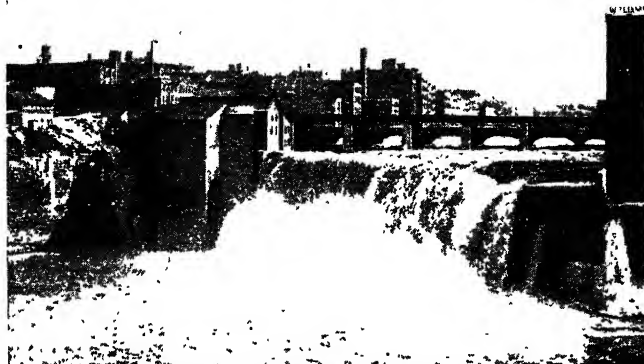
Rock. In geology, the solid material of natural origin which forms the earth. Any particular rock is an individual mass or unit in the heterogeneous assemblage of rocks of which the earth is built. Though rocks are generally considered to be hard and solid, e.g. granite, sandstone, etc., the term is also used to include such unconsolidated deposits as soils, sands, snow-fields, and so forth, so long as they are elements of the earth's crust.

Rocks are classified into three main groups: igneous, sedimentary, and metamorphic. Each group is then subdivided still further on a basis of composition and mode of occurrence. Some rocks are essentially composed of aggregates of one mineral species only, e.g. quartz veins are almost 99 p.c. pure quartz, and some marbles are entirely made of calcite, but most rocks are mixtures of two, three, or more minerals, e.g. granite is a mixture of quartz, feldspar, and one or two varieties of mica, together with certain minor or accessory minerals.

IGNEOUS ROCKS are those which have been formed by crystallisation from molten rock matter derived from depth in the earth's crust. The parental melt is termed *magma* (q.v.) and it may be squirted or injected into cracks or along planes of weakness in pre-existing rocks, forming dykes, sills, etc., or it may be erupted out on the earth's surface as lava. Magma which has cooled slowly deep in the crust forms rocks which are coarsely crystalline throughout. If it is rapidly chilled by contact with cold surrounding rocks, or on being poured out as a lava flow, it forms a fine-grained rock or may consolidate as rock-glass. The chemical composition of the original magma largely controls the nature of the minerals that are formed, and the environment controls their degree of crystallisation, which may vary considerably.

Basalt is a familiar example of igneous rock.

SEDIMENTARY ROCKS are largely composed of material derived from the break-down and erosion of pre-existing rocks, which has been transported by wind, rivers, or ice. Such rocks originated as muds, sands, shingle, etc., which eventually consolidated. Some sedimentary rocks are of chemical origin, and result from the precipitation of material from solution in sea or lake water, e.g. salt deposits and some types of limestone.



Rochester, New York, U.S.A. The bridges across the Genesee river, the upper fall, and the business quarter of the city

it a notable scientific centre. Flour milling and the manufacture of machinery, cameras and photographic appliances, thermometers, boots and shoes, are the occupations. Political interests and social life are highly conservative, as is the press. Settled in 1810, Rochester was incorporated as a village in 1817, and became a city in 1834. Pop. 324,975.

Rochester, EARL OF. English title. It was given in 1652 to Henry Wilmot (c. 1612-58), one of the most devoted followers of Charles I. His son has a separate article. The title became extinct when Charles, 3rd earl, died in 1681. In the same year the earldom was revived for Laurence Hyde, only to become extinct again when his son Henry died in 1758.

Rochester, JOHN WILMOT, 2ND EARL OF (1647-80). English courtier. Born at Ditchley Oxon, April 10, 1647, he succeeded to his father's earldom in 1658, and graduated from Wadham College, Oxford, three years later. After

son published an edition in 1741, and an expurgated edition appeared in Johnson's collection.

Rochester, EDWARD. Name of the principal male character in Charlotte Brontë's novel *Jane Eyre* (q.v.) and eventually the heroine's husband.

Rochet (French; Ital. *roccetto*). The large-sleeved surplice-like vestment worn by bishops and abbots.

Of fine linen, it is worn under the chimere (q.v.). The dressmaker's "bishop's sleeve" is modelled on this garment. In its medieval form it had narrow sleeves, which were enlarged to remarkable size and width, in English usage, in the 17th century.



Rochet as worn by
Anglican bishops

Other limestones are largely composed of shell fragments, or of calcareous material secreted by organisms. Peat and coal, derived from accumulations of dead vegetable matter, are also included among the sedimentary rocks. The chief characteristic of all these deposits is that they are laid down one above the other in more or less horizontal beds or strata. They often contain fossils (*q.v.*), by means of which their geological age can be determined.

METAMORPHIC or altered rocks are those which may have been originally igneous or sedimentary, but have since been changed by geological processes: pressure or movement, heat, and chemical reactions due to interstitial fluids, etc. By these agencies the rocks are recrystallised, and new minerals and new structures are imparted to them. Flaky minerals such as mica or chlorite grow in the rocks normal to the direction of pressure and impart a slaty cleavage to the rock. Similar minerals may develop along directions of shearing in the rocks and, with increasing crystallisation, schists are evolved. In these, the newly formed minerals may be oriented by the movements the rocks are undergoing, or their growth may follow along previously formed planes of weakness—original bedding or cleavage—after movement has ceased. It is probable that the development of schists is largely due to the presence of hot solutions, which facilitate crystal growth, permeating along the channels and pores in the rocks.

With further coarsening in grain size, and the introduction of quartz and feldspar, schists grade into gneisses. These look like banded coarse-grained igneous rocks. Some of this banding may be due to penetration or soak of igneous fluid into the country rock. Such "mixed rocks" are termed *migmatites* (Gr. *migma*, mixture). Many geologists believe that most granites, granodiorites, and diorites owe their origin to some such process, and that these so-called igneous rocks may have been formed by chemical reconstitution of the pre-existing rocks without their having been truly fluid. This process is termed "granitisation" and is at present the subject of very considerable controversy. Consult *Principles of Petrology*, G. W. Tyrrell, 1926; *Metamorphism*, A. Harker, 1932; *Petrology of the Igneous Rocks*, F. H. Hatch and A. K. Wells, 1937.

Gilbert Wilson, Ph.D.

Rockall. Islet of the Atlantic Ocean. A small, rocky peak, about 100 yards in circumference, it stands about 230 m. W. of N. Uist, Hebrides. It is believed to be the only existing fragment of the lost or Paleartic continent.

Rock Climbing. Branch of mountaineering (*q.v.*). The sport of rock climbing began to be practised in Great Britain in the later part of the 19th century, the event which gave it initial impetus being the ascent of the Napes Needle on Great Gable by W. P. Haskett-Smith in 1886. The technique of rock climbing was developed from that of walking on steep ground. It demands the use of the hands, but the strength of the legs is vastly greater than that of the arms, and footwork and balance are therefore the basis of safe rock climbing. The steeper the rocks, the more unavoidable the strain on the arms and fingers, and the greater the need to conserve strength by obtaining all possible help from the feet. Balance rather than force must be relied on since holds may be loose and require very careful testing and handling. Smooth, unhurried movement, although not always attainable, is always the aim.

Importance of Judgement

Even more important than technique is the development of sound judgement—the capacity to distinguish, in any weather conditions or variations of personal form, what can and cannot safely be climbed. A large part of the attraction of the sport derives from the exercise of skill in order to climb potentially dangerous ground safely; and for a climber to have had to take a risk is almost invariably a sign of bad judgement.

The rock climber's equipment consists basically of special footgear—either, for general purposes, specially nailed boots or, on the more delicate routes, rubber or rope-soled shoes—and rope. The proper use of the rope is the climber's greatest safeguard. Climbing rope is usually either of manilla or of nylon, of a circumference of about 1·4 ins., although some climbers prefer to use climbing line, which is considerably thinner. The normal practice on British rocks is for parties of two, three, or four climbers to be roped together at equal intervals and to move one at a time. All except the man actually climbing secure themselves with the rope round a firm spike of rock, or belay. As the leader climbs, his second man pays out rope to him; the leader con-

tinues climbing until he reaches a ledge, or stance, where he can belay himself, when he in turn takes in the rope as the second man climbs. The distance between one stance and the next is called a pitch. The rope is usually paid out over the shoulder, round the back, and under the arm. If a climber slips, his weight is taken directly by the belayed man and indirectly by the rock to which the belayed man is tied, thus greatly reducing the abruptness of the jerk on the rope and the chances that the rope may break. In ascent, only the leader, in descent, only the last man can fall more than a very short distance; the most reliable climber in the party is therefore usually placed in these positions. Often, while climbing, he will be able to safeguard himself by taking a running belay, i.e. utilising a spike of rock or a stone jammed in a crack in order to fix a separate rope loop through which his own rope can be run until he reaches the next safe stance. On some climbs it may be necessary to make an artificial belay by driving a piton, or iron spike, into a crevice; but, although on the Continent pitons are used by advanced climbers as a direct aid, their use in the U.K. is purely protective and resorted to only if absolutely necessary. A small, metal spring-clip, or karabiner, used in conjunction with a rope loop, is, however, very convenient for running belays, etc.

Most climbers find climbing more awkward when descending than when ascending. On difficult passages in the descent, or for the sake of speed, a party may slide down a spare rope doubled round a belay, the rope being retrieved by the last climber.

Classification of Climbs

Rock climbs are rigidly classified according to a conventional system based on good conditions; the difficulty of any particular climb will, however, vary greatly according to weather and season. A strong wind affects the climber's balance; wet rock makes rubber shoes worse than useless and destroys much of the aid which can be gained from pressure and friction, besides numbing the fingers; snow and ice change the character of a cliff, and call for the use of the ice-axe and a completely new technique. Many of the harder climbs cannot be climbed at all in unfavourable conditions.

The best climbing areas in the U.K. are the Lake district, N. Wales, and parts of the Scottish Highlands—especially Ben Nevis,

Glencoe, and Skye. Excellent short routes are to be found on the gritstone outcrops of the Pennines. There are many well-established climbing clubs, often with local connexions with one particular district. A few clubs have climbing huts in their own districts. The clubs also publish very detailed guidebooks to most of the better known British cliffs.

A. D. M. Cox

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Rock Cress. Large genus of annual and perennial herbs of the natural order Cruciferae, also known as *Arabis* (*q.v.*).

Rock Crystal. The clear, colourless crystals of quartz (*q.v.*). It is used in cheap jewelry, and in the manufacture of optical components of scientific apparatus. Specially selected crystals showing piezoelectric properties are used in radio and in certain refined instruments for measuring pressure variations.

Rockefeller, JOHN DAVISON (1839-1937). American capitalist. Born at Richford, N.Y., U.S.A., July 8, 1839, he began business as a commission agent at the age of 19, and in 1862 became connected with the oil business, building the Standard Oil



John D. Rockefeller, American capitalist

Refinery at Cleveland, Ohio, in 1865. Branches were opened, and five years later a combination of firms was formed as the Standard Oil Company with a capital of £200,000, J. D. Rockefeller being president. By 1882 the combine had absorbed or out-rivalled nearly all similar concerns in the U.S.A., and Rockefeller had become the wealthiest man in the world. He retired from business in 1911, having already devoted to charitable and educational objects a total sum estimated at more than £150,000,000. He lived until May 23, 1937, dying at Ormond Beach, Florida. *Consult* God's Gold: John D. Rockefeller and his Times, J. T. Flynn, 1933.

Rockefeller, JOHN DAVISON, JUN. (b. 1874). American industrialist and philanthropist. Son of the above J. D. Rockefeller, he was

born at Cleveland, Ohio, Jan. 20, 1874, and educated at Brown university. He entered the office of Standard Oil and in due time became one of its directors. In 1910 he retired from the board in order to assume the management of his father's benefactions and the chairmanship of the Rockefeller Foundation (*v.i.*), but as a large stockholder he continued to influence Standard Oil's business policies. He distributed his own benefactions not through groups of experts but directly, according to his special interests. He thus made munificent donations for negro education, the restoration of Reims cathedral, the exploration of Egyptian antiquities, and the victims of Japanese earthquakes. In 1946 he presented the United Nations with land worth some £2,000,000 as a site for its h.q. in New York City.

Rockefeller

Centre. Largest business and entertainment centre in the U.S.A. Planned and owned by John D. Rockefeller, jun., it occupies more than 12½ acres in the heart of New York City. Of this area 82 p.c. is leased for \$3,500,000 (approx. £900,000) a year from Columbia university. The lease will expire in 1915, and the buildings will then become the property of the university. The centre was constructed during 1931-40. It consists of 15 buildings several of which exceed 400 ft. in height. The tallest is the Radio Corporation of America building, which has 70 storeys, reaches 850 ft., and is said to be the largest



Rockefeller Centre. In the heart of New York City, U.S.A., the centre was planned and owned by John D. Rockefeller, jun. It was constructed 1931-40 and consists of 15 buildings, covering more than 12½ acres. The numbers indicate: 1, E.C.A. Building, 70 floors; 2, R.K.O. Building, 31 floors; 3, Radio City Music Hall; 4, International Building, 41 floors; 5, British Empire Building; 6, La Maison Française

office building in the world. This building and four others constitute Radio City (*q.v.*). Among other separate structures are the British Empire building, La Maison Française, Time and Life building, and the Associated Press building. The main thoroughfares within the centre are Rockefeller Plaza, 60 ft. wide, and the Channel, which runs between the British and French buildings.

A total of more than 32,000 persons work in the business offices of more than 1,000 companies and

their subsidiaries. The number of visitors per day to the centre in 1947 was estimated at 128,000.

Rockefeller Foundation. Wealthiest public trust in the U.S.A. It had an original endowment of \$182,814,480 (then worth about £36,500,000) and its assets in 1947 amounted to \$138,226,637 (then worth about £44,500,000). It was incorporated in New York in 1913, through a gift from John D. Rockefeller, sen., in order to "promote the well-being of mankind throughout the world." Most of its benefactions, which are international in scope, are administered indirectly through governmental and other agencies in the fields of the medical, natural, and social sciences, and public health. It established the China medical board in Peiping, and works in close alliance with the Rockefeller institute for medical research (v.i.). It lays special stress upon the training of qualified personnel in the various branches of knowledge in which it is interested. It is directed by a self-perpetuating board of trustees, who are free from all restrictions, having power to dispose of the principal as well as the income.

Rockefeller Institute. Short title of an institute for medical research founded 1901, at the suggestion of Frederick Taylor Gates, by John D. Rockefeller, sen., in New York City. Its full name is Rockefeller Institute for Medical Research. The donor erected and endowed the necessary buildings at a cost of £800,000, and the original charter was amended, 1908, to extend the scope of investigation. The institute includes well-equipped chemical, pathological, etc. laboratories, and a large hospital. In 1907 a farm in New Jersey was added for breeding animals for experimental purposes, and a further biological laboratory was opened in Massachusetts, 1911. A notable rule of the institute is that all discoveries and inventions made by salaried members of the staff must

be offered for the public benefit. The institute issues *The Monthly Journal of Experimental Medicine*, and other publications. See Rockefeller Foundation.

Rocket (*Hesperus matronalis*). Perennial herb of the natural order Cruciferae, known also as dame's violet. The name rocket is also applied to several other plants e.g. London rocket (*Sisymbrium iris*), dyer's rocket (*Reseda luteola*), sea rocket (*Cakile maritima*), yellow rocket (*Barbarea vulgaris*). See Cruciferae; Dame's Violet.

Rocket, THE. Name of a steam locomotive built by George Stephenson (q.v.). This engine, in Oct., 1829, won the prize of £500 offered for the most efficient locomotive by the directors of the Liverpool and Manchester rly., of which Stephenson was the engineer. Three other engines were entered for the competition, the only serious rival to the Rocket being Braithwaite's Novelty. The tests took place over a level 2 m. stretch of line, and the Rocket proved infinitely superior in speed and reliability, covering 12 m. in 53 mins. on the opening day of the trials. After doing good service for many years, the Rocket was withdrawn, and ultimately found a home in the Science Museum, South Kensington. See Locomotive and illus.; Railway.

Rocket (Ital. *rochetta*, a distaff, which a rocket on its stick resembles in shape). Type of firework. Rockets vary with the purpose for which they are made, but the principle on which the "body," or portion imparting motion to the projectile, is constructed and its essential design are always identical. The principle is similar to that of the recoil of a gun; the gas produced by the rapid burning of a suitable mixture, or "composition" (G), in a cylindrical case (H), sets up an internal pressure, which is allowed to escape through an opening at one end with the result that the case is forced forward. The fact that the rocket is propelled by in-

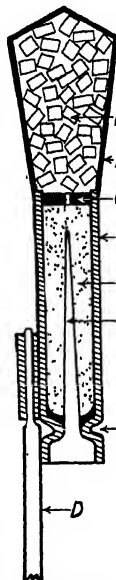
ternal pressure—not by the impact of the escaping gas on the air, as is often erroneously supposed—and would therefore function equally well outside the earth's atmosphere has attracted the attention of designers of interplanetary projectiles. (See Rocket Propulsion.)

In order that the pressure may be built up rapidly a proportionately large surface of the composition is exposed to ignition by leaving a tapering cavity (A) up its centre. The pressure is increased by "choking," or reducing the opening by which the gas escapes (B). A wooden stick (D), of sufficient length and weight to balance the rocket and guide it in flight, is attached to its side.

THE SKY ROCKET, used for display or signalling (see diag.), has a case (H) of rolled paper, to which is fitted a "cap" (E), cylindrical or conical in shape, containing coloured stars (F) or other pyrotechnic effects. These are lighted and blown from the cap by a small explosive charge, which is ignited when the composition above the cavity burns up to the clay diaphragm (G) and passes through the hole in its centre. Some signal rockets

carry in the cap only an explosive charge. The composition in rockets of this type is a mixture of the three ingredients of gunpowder, saltpetre (potassium nitrate), sulphur, and charcoal, but in different proportions. It is consolidated either by repeated blows of a wooden mallet or a wooden "drift," or by hydraulic pressure.

ROCKET APPARATUS. Contrivance consisting of rocket and tube, by means of which a thin line is thrown to a vessel wrecked near the shore, the range being about 100 yds. By means of the thin line a hawser is hauled to the ship in distress and made fast to the shore, and the rescue is carried out by means of a sling or breeches buoy, which is hauled backwards and forwards along it. The appara-



Rocket. Diagram illustrating a sky rocket used for signalling. See text



Rockefeller Institute, New York. The original building (centre) was erected 1901

tus is very mobile, everything being kept in readiness at each station in a light cart or wagon. In 1855 the British govt. took over the system of rocket apparatus formerly maintained by the Royal National Lifeboat institution. There are some 350 rocket apparatus stations round the coasts of the British Isles; since 1870 more than 12,000 lives have been saved by means of this contrivance.

A development of the line-carrying rocket is the Schermuly pistol rocket, a compact and comparatively light apparatus, designed to carry a line from ship to shore. Apart from the advantage of firing with the wind, as is the case from a vessel blown into a lee shore, and the far larger target offered by the coast as compared with a partially submerged wreck, the range of the rocket is increased materially by the initial velocity provided by its discharge from the pistol.

ROCKET POST. Experiments in the dispatch of mail in contain-

ers placed in the heads of powder rockets were begun in Austria in 1928 by Friedrich Schmiedl, and continued in Germany (from 1931), India (from 1934), and the U.S.A. (from 1936). In Austria mail was dispatched over the Tirol mts., in Germany over the Hartz mts., and in India in the E. Himalayas; other distances crossed were the Brisbane and Ganges rivers, the English Channel, and from ship to shore in many parts of the world. The parachute rocket, in which at the start of downward flight a parachute was released to retard fall, was used in Australia in 1937; experimental firings were also carried out in the Netherlands, France, and elsewhere in Europe, as well as in Cuba and Mexico. In India livestock, food, and first-aid apparatus have been carried in addition to mail; in Spain, Finland, and Denmark propaganda leaflets were dispatched in wartime. No regular postal service had been set up by 1948.

ful rocket-powered flight on Sept. 30, 1929. In 1930, Valier joined Heyland in the production of a car driven by a liquid oxygen and petrol rocket unit which proved superior to the solid fuel unit in positive control, ease of regulation, and simplicity of installation. These private activities were terminated when the Nazis came to power in Germany, and subsequently all developments were conducted in strictest secrecy, the potential military value of the liquid fuel rocket being fully realized; at the end of the Second Great War Germany was at least ten years ahead of any other country in knowledge and achievement in this field.

Rocket units have been applied to (1) assisting the take-off of conventional land or water-borne aircraft; (2) the main or auxiliary propulsion of aircraft; (3) powering long range missiles which may be guided, controlled, or homed on the target.

Rocket assisted take-off was first suggested in 1927 for German seaplanes, and some time later a Junkers craft took off with the aid of Sander powder rockets. Solid fuel rockets were used by all combatants in the Second Great War to facilitate the take-off of heavily laden bombers. The Germans also developed special liquid fuel rockets for this purpose. At first liquid oxygen and petrol units were used, but these propellants gave off a large flame and intense heat liable to endanger the aircraft and were discontinued in favour of hydrogen peroxide and hydrazine hydrate, hydrogen

ROCKET PROPULSION AND WEAPONS

G. Geoffrey Smith and David Le Roi

The history of the development of the use of rockets as a propulsive force is here recounted, and is followed by some account of the adaptation of rocket propulsion to aircraft and weapons of war

Rocket propulsion and rocket weapons have both been developed from the firework rocket (*v.s.*). Early experiments in rocket propulsion were disappointing and inconclusive, owing to lack of knowledge and of technical facilities and finance. In various countries preliminary investigations were, however, made by private organizations of enthusiasts with limited funds, and from these data were gradually accumulated. From time to time experimental motors and rockets were built, usually in connexion with astronautics for which the rocket appears to offer the only possible means of propulsion. Probably the most notable of these societies was the *Verein für Raumschiffahrt* (society for space travel), usually referred to in English as the German rocket society. This body advocated the liquid fuel rocket motor and discounted the usefulness of the solid fuel motor except for the short range missile or the auxiliary propulsion of aircraft for short periods. It emphasised that the rocket was a practical proposition only for speeds above sonic velocity and was not a suitable means of propulsion for land vehicles or water-borne craft. The society built a number of small liquid fuel rockets.

The first liquid fuel rocket motor, however, was built by an American scientist, R. H. Goddard. Using liquid oxygen and petrol, this motor was operated on a test bed on Nov. 1, 1923. Goddard also shot the first liquid fuel rocket which, on March 16, 1926, flew on a high trajectory a distance of 184 ft. in 2.5 secs. (*See Rocket: Rocket Post.*)

Many attempts were made to apply powder rockets to motor cycles, automobiles, motor boats, ice sleds, rail cars, and aircraft. Outstanding were the Valier and Sander experiments with Opel cars fitted with batteries of rockets fired in succession. In the first public test in 1928 one of these cars exceeded 70 m.p.h.; in 1929 another car achieved almost 125 m.p.h. In 1928 an unmanned rail car attained a top speed of about 180 m.p.h.

The value of these experiments was entirely negative, but later, Fritz von Opel experimented on aircraft and made the first success-



Rocket. Douglas twin-engine commercial transport becoming airborne with rocket assisted take-off

peroxide and calcium permanganate, or nitric acid and aniline, which gave lower jet temps. Such units were jettisoned immediately after use and retrieved for replenishment. As they were liable to suffer damage in this operation they were eventually fitted with parachutes which were released automatically.

Rocket assistance can reduce the take-off time and length of run of land planes by 40-45 p.c. and of flying boats by 45-50 p.c.

Specific Impulse of Various Propellants

Oxidiser	Fuel	Specific Impulse lb.-sec./lb.
Liquid oxygen	Liquid hydrogen	350
" "	Alcohol	235
" "	Petrol	225
Hydrogen peroxide	Hydrazine hydrate	200
Nitric acid	Aniline	220

Take-off rockets are used also for lifting land planes from the decks of carriers and for launching heavily laden towed gliders. The large Messerschmitt transport glider, which could carry two medium tanks, was assisted in the take-off by two liquid fuel rockets under each wing.

Except in the Opel car demonstration and the Japanese "Baka" craft, solid fuel units were not used for main propulsion owing to their dangerous characteristics, uncontrollability, and short duration. The "Baka" was a glider bomb, launched from a parent aircraft and guided to its target under rocket power by a suicide pilot.

During July-Oct., 1938, the Germans conducted a series of careful tests of liquid rocket propulsion on a Heinkel aircraft. Starting with full power from the conventional engine supplemented by a rocket unit in the tail, the engine output was progressively reduced until complete flights were accomplished solely on rocket power. The Walter rocket unit, working on concentrated hydrogen peroxide and hydrazine hydrate in methanol, was used. From these beginnings the Germans evolved the Messerschmitt 163, the first operational rocket-driven aircraft. It was designed specifically to intercept Allied bomber formations and could climb to an alt. of 4-5 m. over a range of 14 m. whilst a Flying Fortress bomber was travelling 12 m. The rocket unit weighed about 415 lb. and developed a thrust of 3,740 lb. Carrying 5,570 lb. of propellant the aircraft could be operated on full power for only about 4-5 mins. A small cruising unit producing a thrust of 660 lb. was fitted to enable it to extend its endurance when in the air. Maximum speed at the service ceiling, 30,000 ft. (reached in 2-6 mins.)

was 590 m.p.h. with both main and auxiliary units in operation.

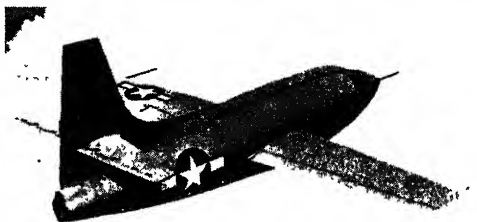
Another piloted German craft was the Bachem "Natter," a semi-expendable interceptor for defending specific targets. It was launched at an angle of 75° by two solid fuel rockets which were jettisoned at a height of about 5,000 ft. The

Walter liquid rocket unit then took over and the aircraft continued to climb. Initial flight was directed and controlled from the ground, and the sole duty of the pilot was to control the craft during the last few hundred yards of its flight towards the bomber formation. After delivering an attack the pilot abandoned ship. The front portion of the craft was jettisoned, while the rear portion, containing the rocket motor, was returned to earth by an automatically released parachute.

After the war, rocket units of this type were produced in the U.K. and the U.S.A. and used on special aircraft investigating the problems of high speed flight at and beyond sonic velocity. Examples are the Bell XS-1 piloted craft and the Vickers pilotless research model. Both of these are launched at altitude from a carrier aircraft. In 1948 it was announced that the Bell XS-1, powered by an American built, four-jet rocket unit, had exceeded sonic velocity (743 m.p.h. at sea level and 660

Zwei (V2 or Reprisal Weapon 2, also called A4) rocket, which had an initial weight of about 12-8 tons and a range of more than 200 m. At the end of the Second Great War a German project for an 85-ton rocket was discovered.

In general, solid fuels were used for short range rockets; after the initial impulse, which was of very short duration, they continued their flight as an ordinary artillery projectile. The more costly and elaborate liquid fuel rockets were used for long range objectives, attack on specific well-defended targets, or for the interception of high speed bomber formations. For attacking adequately defended targets on land or sea, exceptionally high velocity is necessary: with radar detection and anti-aircraft guns firing shells with

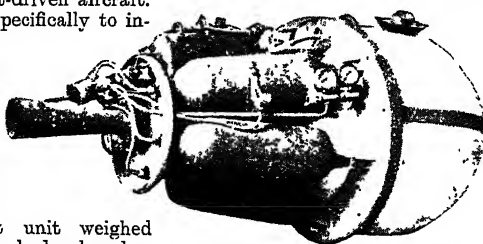


Rocket. Bell XS-1 piloted rocket aircraft, with a speed exceeding that of sound

proximity fuses, it was proved in the Pacific that a 400 m.p.h. bomb controlled by a suicide pilot could be destroyed before it reached its target.

The Germans produced a variety of missiles, some of which, particularly for defence against air attack, were developed to the operational stage. The "Evian," resembling a small aeroplane and powered by a nitric acid and aniline motor, was launched by four solid fuel rockets from a gun mount. Another ground-to-air missile, similarly powered and assisted by two solid fuel rockets, could be launched by two men. Both were furnished with proximity fuses for the warhead. The *Wasserfall* was a scaled down version of the V2 rocket furnished with wings; it was guided and controlled from the ground by radio.

Two rocket bombs for interception were the HS298, with a range of about 2-5 m., which was under radio control from the launching aircraft; and the X4 which, to prevent radio interference, was electrically controlled by means of twin wires simultaneously unreel from the missile and the parent aircraft.



Rocket. German rocket motor used for vertical climbing interceptors

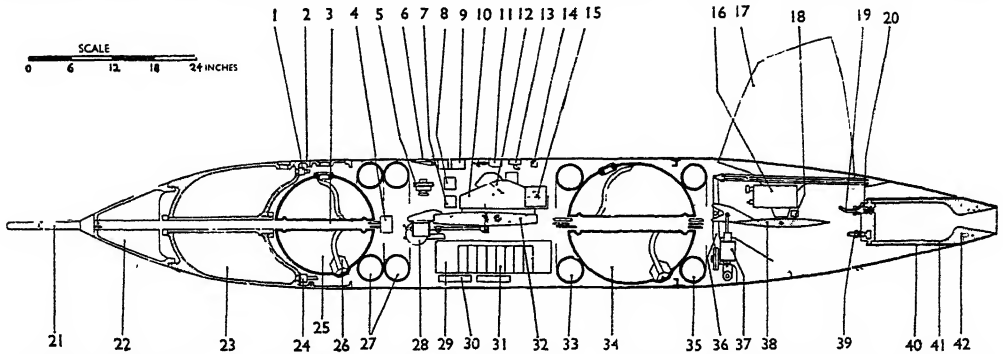
m.p.h. at 40,000 ft. alt.), but no details were disclosed.

Rocket missiles may be as small as the tiny "bazooka" with a range of a few hundred yards fired from a man's shoulder, or larger than the German *Vergeltungswaffe*

The outstanding missile was the V2 rocket which, though of limited military value, was a substantial

elevated on to the launching platform by hydraulic jacks. Fuelling had to be effected immediately be-

pulse," which is a combination of the thrust produced (lb.) for the duration of time (sec.) for the



Rocket. Sectional diagram showing arrangement of Vickers-Armstrong supersonic aircraft. 1. Non-return valve in air pipe. 2. Air pressure pipe. 3. Pipe conduit. 4. Airspeed indicator. 5. Reducing valve. 6. Hot air, external supply. 7. Longitudinal accelerometer. 8. Normal accelerometer. 9. Suspension hook retracted. 10. Automatic pilot. 11. Rocket starting switches. 12. Position gyroscope. 13. Electric external services. 14. Air external supply. 15. Rate gyroscopes, roll and pitch. 16. Radar transponder. 17. Fin. 18. Reactance. 19. Hydrogen peroxide inlet. 20. Mixing valve and burner. 21. Pilot head. 22. Balance weight. 23. Fuel, alcohol hydrazine hydrate. 24. Safety diaphragm. 25. Hydrogen peroxide. 26. Anticavitation vanes on outlet pipe. 27. Air supply for pressuring tanks. 28. Servo motor for ailerons. 29. Telemetering 8 channel unit. 30. Oscillator. 31. Batteries. 32. Main plane. 33. Air supply for pressuring tanks. 34. Hydrogen peroxide. 35. Air supply for controls. 36. Locking device for tail plane. 37. Twin Servo motors. 38. Tail plane. 39. Alcohol fuel inlet. 40. Combustion chamber. 41. Polygon lining. 42. Carbon venturi

technical achievement. It had a total length of 46 ft. and a maximum diam. of 5 ft. 5 ins. Its full

weight before launching, 12·8 tons, was made up: structure, 1·7 tons, power unit and equipment, 1·3 tons, warhead, 1 ton, fuel, 8·8 tons. The main propellants were liquid oxygen and a 75 p.c. solution of ethyl alcohol in water. About 400 lb. of auxiliary fuels, hydrogen peroxide and sodium permanganate, were required to feed a turbine which drove the two pumps supplying the main propellants to the combustion chamber. These pumps, delivering about 275 lb. of fuel per sec. at a pressure of 350 lb. per sq. in.,

could discharge the contents of the main fuel tanks in 70 sec. The rockets were transported on trailers to the firing site and fore firing as the liquid oxygen was lost by evaporation at a rate of about 4·5 lb. per min. if left standing. Initial flight was vertical, but an automatic gyro-pilot turned it from the vertical and directed it on to its course until it took an angle of about 45° to the horizontal after about 60 secs. flight, when all the fuel had been consumed. Thereafter the flight was parabolic and the alt., or trajectory, reached was the normal one, of about a quarter of the range. The highest velocity was reached at the "all-burnt" position, when the total weight had fallen to about 4 tons and the rocket was travelling at about 5,000 ft. per sec. (3,400 m.p.h.). This was also the point of highest acceleration, which approached 8 g (257 ft./sec.²). It is estimated that when the "all-burnt" condition was reached the output of the rocket unit was equivalent to more than 600,000 h.p. Operationally the V2 had a range of 180-220 m. The maximum height reached was probably about 60 m.

The choice of liquid oxygen and alcohol for the V2 was probably determined by considerations of availability of supplies, for better combinations are known. Rocket propellants are evaluated for comparison on their "specific im-

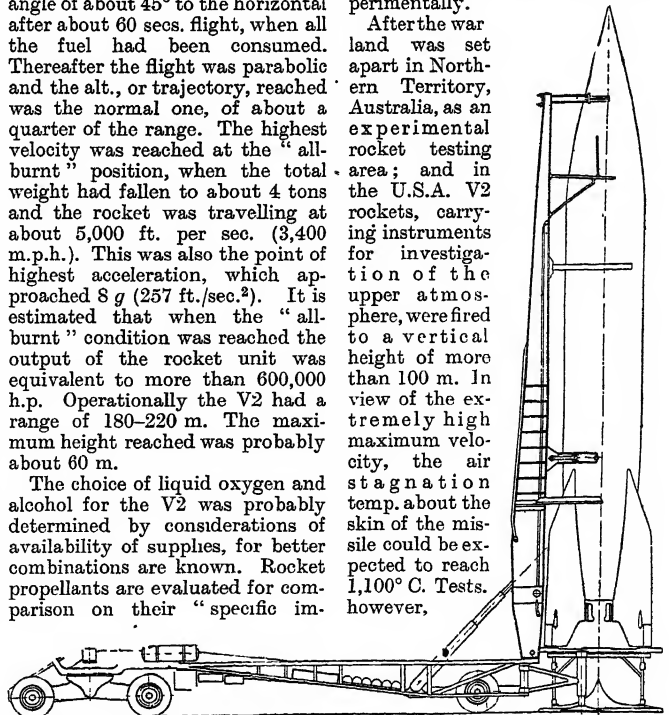
quantity of fuel consumed (lb.), and is usually expressed as lb.-sec./lb. (see table). Liquid oxygen and liquid hydrogen form theoretically an ideal fuel, but it is difficult to store and dangerous to handle, though it has been used experimentally.

After the war land was set apart in Northern Territory, Australia, as an experimental rocket testing area; and in the U.S.A. V2 rockets, carrying instruments for investigation of the upper atmosphere, were fired to a vertical height of more than 100 m. In view of the extremely high maximum velocity, the air stagnation temp. about the skin of the missile could be expected to reach 1,100° C. Tests, however,

Rocket. Launch of V2 rocket in the U.S.A. for investigation of the upper atmosphere

could discharge the contents of the main fuel tanks in 70 sec.

The rockets were transported on trailers to the firing site and



Rocket. Method of transporting and setting up V2 rocket

showed that owing to conduction and radiation the actual skin temp. did not exceed 650° C. See N.V.

G. Geoffrey Smith
ROCKET WEAPONS. Rocket missiles activated by powder propellants were the earliest explosive projectiles, first used on a large scale in the Chinese-Tartar war of 1232. Introduced into Europe about a century later, they contributed to the Venetians' successful siege of Genoa in 1380; and in 1429 rockets having warheads filled with Greek fire were used against the English at the siege of Orleans. In 1561, a French army engineer wrote the first text book on military rockets and suggested making the cases of leather instead of bamboo.

Rockets were extensively used in the Thirty Years' War (1618-1648), the most common type having a grenade head which, on bursting, threw fragments after the manner of a shrapnel shell. By the end of the 17th century, most Continental armies used rockets weighing 120 lb. with a warhead containing 16 lb. of explosive.

For long after the introduction of artillery the rocket rivalled the gun in military favour; but towards the close of the 18th century the very success of the gun as a projector of heavy missiles revived interest in the rocket. As guns became larger and more destructive, their mountings increased in weight and became therefore more difficult to move. Rockets required no heavy or elaborate mountings for their discharge, and their projectors could be moved from place to place with ease.

In 1783, Tippoo Sahib, rajah of Mysore, threw the Mahratta cavalry into confusion with rocket fire, and at the battle of Seringapatam over 2,000 rockets were discharged against the British cavalry. Their effect, although they were somewhat erratic, was deadly owing to the manoeuvrability of their projectors; and the British military authorities began to experiment with rockets.

In 1804 the British army adopted the Congreve rocket, named after the inventor, Sir Witham Congreve. The missile consisted of a cast-iron cylinder terminating in a cone, or warhead, which was either solid, for discharge against fortifications, or fitted with small shot and having a contact fuse, for use against troops. There was also a warhead filled with an explosive incendiary composition for firing magazines and ammunition dumps, and a rocket with an incendiary

charge and a pointed metal nose that embedded itself in the wooden ships against which this naval type of rocket was used. The rocket was fired from a light, metal tube fixed on an adjustable stand. Elevation of the stand governed the range: for every degree of elevation, range increased by 100 yds. up to a maximum of 3,500 yds. To counteract the rocket's inherent instability in flight, the outer casing of the projectile had four stabilising fins. The largest of the five standard types used weighed 32 lb., including the warhead.

Congreve Rockets

Congreve rockets, operated by a rocket brigade of the R.A., were first used in action in 1806 at the siege of Boulogne and set the town on fire. They were also used with good effect at Walcheren and Copenhagen in 1807, at the bombardment of Flushing in 1809, and at Waterloo in 1815. In 1835, an improved case fitted with a series of propellant charges that ignited in succession increased the projectile's range and penetrating power. These were used at the siege of Acre in 1840 and in the Burma war of 1840-42.

In 1850 five small holes were drilled in the walls of the rocket's combustion chamber through which a proportion of the gases generated by the propellant charge was forced, causing the missile to rotate on its axis in the same way as a bullet discharged from a rifled barrel. Projectors from which six of these rockets could be discharged simultaneously were used at the siege of Sebastopol. The rocket gave way to the more destructive and accurate rifled gun of the late 19th century.

There is little recoil when a rocket is discharged, so that the projector can be lightly constructed. Unlike a shell, the rocket does not lose velocity in passage from projector to target, and, gathering impetus from successive explosions of the propellant charge, strikes the target with maximum impact. The disadvantages of the older types of rocket were the weakness of the propellant charge and the comparatively low destructive effect of the explosive warhead.

During the First Great War incendiary rockets were developed for use against airships and observation balloons. They were fired from electrically-operated launching rails beneath an aircraft's wings and had a gunpowder propellant. The head of the rocket was fitted with a barb which stuck to the airship fabric, when the ex-

haust from the rocket ignited the hydrogen in the gasbag.

Some years before the Second Great War, the U.K., Russia, Germany, and France experimented with various types of rocket weapons. New and more powerful propellants were developed, and new explosives of high destructive effect which could be concentrated in a comparatively small warhead.

Long-range application of the rocket, brought into effect by the Germans in their V2, also formed part of the British research programme, but it was early decided to concentrate on a rocket gun to fill a gap in A.A. defence. The resultant rocket and projector were less accurate than the shell-firing A.A. gun, but this was of less importance as firing was normally in salvos of 100 rockets to produce a barrage. The lethal effect of a single rocket which found its target was equivalent to that of a 3·7 in. shell.

Further experiments resulted in the introduction of rocket guns for ground targets. One of the earliest of these was the American bazooka (*q.v.*). Rockets solved the problem of providing aircraft with ground assault armament having the destructive effect of a heavy gun. In the later stages of the Second Great War, Hurricanes, Typhoons, and Swordfish aircraft were equipped to launch rockets each of which had the impact effect of a 5·5 in. shell.

Rocket guns are essentially barrage weapons and, at the Allied landing in Sicily, July, 1943, and subsequent Allied landings, were used mounted on assault landing craft to saturate beach defences before the first troops were put ashore; individual craft fired several hundred rockets, each equivalent to a 5·5 in. shell. Heavy anti-tank rocket guns were mounted on armoured vehicles for saturation bombardment of enemy armour and strongpoints. The projectiles were fitted with time and contact fuses, and were launched from multiple projectors firing 30 at a time to a maximum range of 5 m.

The rockets of the Second Great War were much less accurate than shells fired from sighted barrels, but after it experiments were conducted in the development of rocket projectiles guided to their targets by remote radio control. See Parachute and Cable Unit.

David Le Roi

Rock Fish. Popular name for certain species of wrasse (*q.v.*), a large group of fishes which occur

among rocks and coral reefs. Several species are found round the British coasts.

Rockford. City of Illinois, U.S.A., the co. seat of Winnebago co. It stands on Rock river, 84 m. by rly. W.N.W. of Chicago, on the Illinois Central and other rlys. It is the seat of Rockford College. Water power is obtained from the river for the city's industries, which include the manufacture of mechanical harvesters sent to most grain-producing countries. Settled in 1834, it was chartered as a city in 1852. Pop. 84,637.

Rockhampton. A town in Queensland, Australia. It lies on the Fitzroy river, 396 m. by rail N.W. of Brisbane. The terminus of the Central Queensland rly., and the port for the mines at Mt.



2nd Marquess of Rockingham, British statesman After Reynolds

Whigs, becoming active at this time as an opponent of Bute. In 1765, on the fall of Grenville, Rockingham became prime minister, but resigned the following year. He remained an opposition leader until March, 1782, when he was again at the head of a ministry, but three months later,

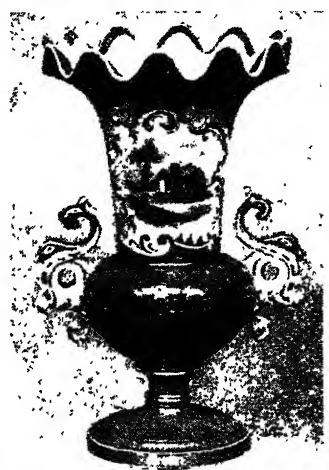
July 1, 1782, he died. He left no children, and his titles became extinct. His estates in Northamptonshire and Yorkshire passed to his nephew, Earl Fitzwilliam (q.v.).

Rockingham was descended from Sir Lewis Watson (1584-1653), of Rockingham Castle, who, in 1645, was made a baron, a reward

for his loyalty to Charles I. His son Edward and then his grandson Thomas succeeded to his title and estates. The latter was made earl of Rockingham in 1714, but the title became extinct on his death in 1746. The barony, however, passed to a kinsman, Thomas Watson-Wentworth, who was made a marquess in 1746, and was the father of the prime minister.

Rockingham Ware. Pottery formerly made on the estate of the marquess of Rockingham, at Swin-

ton, near Sheffield. The works were established in 1745 and were successively controlled by Twigg, Bingley & Co., and Bramell. Rockingham ware is of a chocolate hue, the teapots, which are characteristically long, coffee-pots,



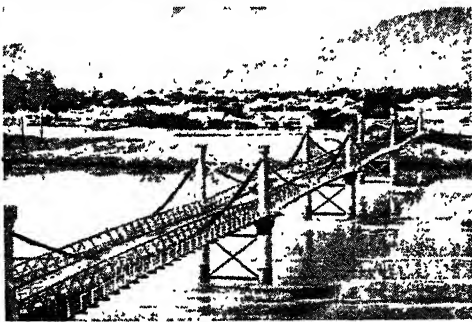
Rockingham Ware. Vase with painted landscape

jugs, and mugs being lined with white. Quaint tea and coffee pots, shaped like fruits, with moulded leaves stuck on, were produced here, and known as "Cadogans." Fine blue and white pottery was also produced in these works.

Rocking Stone OR LOGAN STONE. Massive rock so poised as to be readily swayed by hand pressure. It may be an ice-transported boulder, or a granite mass resting upon a weathered base, as at Sittaford Tor, Dartmoor. Such stones are frequent in Cornwall, Derbyshire, Yorkshire, Wales, lowland Scotland, and Ireland, often near Neolithic stone monuments, and they are associated with much local folklore. The Logan Rock (q.v.), Land's End, weighs about 70

tons; and one at Tandil, Argentina, 700 tons. Among the Kelasa Hills, Burma, a Buddhist temple crowns a rocking stone that is 3,650 ft. high.

Rock Island. City of Illinois, U.S.A., the co. seat of Rock Island co. It stands at the confluence of



Rockhampton, Queensland. Suspension bridge over the Fitzroy river, looking towards North Rockhampton

Morgan, it has rly. connexions with the other capital cities. The dist. grazes a quarter of a million cattle, and contains large meat-works, three collieries, and gold and copper mines. Pop. 34,000.

Rockingham. Village of Northamptonshire, England. It stands near the Welland, 8 m. N. of Kettering, and is noted for its castle, of which some ruins are left. This is said to have been built by William the Conqueror for the protection of the ironworks in the surrounding forest. It was rebuilt in the 16th century, but was destroyed after the Civil War. Rockingham was once a market town. S. Leonard's Church has monuments of the Watson family, who owned the castle, and took their titles from here. To the S. and E. extended the royal deer forest of Rockingham, of which a few patches remain. Pop. 184.

Rockingham, CHARLES WATSON-WENTWORTH, 2ND MARQUESS OF (1730-82). British statesman. Born May 13, 1730, he was educated at Westminster school and S. John's College, Cambridge. A member of the Whig party, he was



Rocking Stone. The Logan Stone, Rippon Tor, a famous rocking stone on Dartmoor



Rock Plants. Arrangement of a small rock garden, showing how the stones can be grouped in their natural positions, and the plants disposed in pockets and crevices

Rock and Mississippi rivers, opposite Davenport, and is served by rlys. and the Hennepin (or Illinois and Mississippi) Canal. It has the Augustana College and Theological Seminary, and on the neighbouring island, from which the city received its name, are the U.S. arsenal and armoury, about 965 acres in extent. This is a federally owned plant in which 1,600 varieties of arms are produced. E. of the island the channel has been dammed to provide water power for the city's industries. These include flour milling, iron founding, brickmaking, and the manufacture of lumber products, agricultural implements, carriages, stoves, and floorcloth. Settled in 1836, Rock Island was incorporated in 1841, and became a city in 1849. Pop. 37,953.

Rockling (*Motella*). Genus of shore fishes belonging to the cod family and nearly related to the ling. They are all of small size, and are represented in the British seas by several species. The young of one of these, formerly called

mackerel midge, was long regarded as forming a separate genus.

Rock Melon. This plant is dealt with under its alternative name of Cantaloupe. *See also* Melon.

Rock Plants. Miscellaneous genera of plants which grow in rock gardens. Most of them are natives of mountains and high valleys, but some which are not true alpiners, e.g. aubrietia and dwarf phlox, are also grown in the rock garden. They flourish in well drained soil on sloping ground. Thus, if a rock garden is made on clay such materials as sand, broken brick, and stones must be added to make it porous. Perfect drainage is the secret of success. Rock plants flower chiefly in April, May, and June. If the amateur begins with aubrietia, alyssum spinosum, alyssum saxatile, aethionema, phlox subulata, and its varieties, the Cheddar pink and other dwarf pinks, and androsace Chumbyi, silvery-leaved and mossy saxifrage, blue and yellow flaxes, houseleeks, dwarf bellflowers, and thymes, he can scarcely fail, for all are easily managed. Most rock plants need sunny places, but a few must be grown in shade.

Rock plants need much moisture in late spring and early summer, and should be watered in dry weather. Those of spreading growth, e.g. aubrietia, alyssum, and arabis, should be cut back after flowering and top-dressed with sandy leafy compost. The most difficult rock plants are those from

alpine screes at high altitudes; they will flourish in lowland gardens only in a moraine which can be made by excavating 18 in. deep, putting in a 12-in. layer of drainage, and on top a 6-in. layer of stone chips or small stones mixed with a little soil. *Consult* The English Rock Garden, R. Farrer, 1919; Rock Plants, C. Elliott, 1935; The Rock Garden and Alpine Flowers, G. A. R. Phillips, 1947.

Rock Rose (*Helianthemum vulgare*). Trailing shrub of the family Cistaceae. It is a native of Europe, W. Asia, and N. Africa. It has opposite, oblong leaves, hairy on the upper side and downy beneath. The clear yellow flowers are about an inch across. It abounds on chalk hills and dry soils. Many other species and varieties of great beauty are cultivated in rock gardens.



Rock Rose. Flowers of the trailing shrub found on chalk hills



Rockling. *Motella mustela*, the five-bearded rockling
W. S. Berridge, F.Z.S.



Rocky Mountains. Bow Valley and the Bow River, Alberta. A characteristic scene where the Canadian Pacific Railway traverses the Canadian Rockies. Near the head of the valley is Kicking Horse Pass

Rock Sculptures. Primitive designs incised upon rock surfaces, megalithic monuments, and other prehistoric stone objects. The simplest neolithic type comprised cup and ring markings. Other devices, presumably votive, are found at Gavrinis, in Brittany, N. Africa, and elsewhere. In the sterile Italian Maritime Alps 7,000 designs have been found—ploughs, oxen, sickles, ploughmen—illustrating primitive Ligurian agriculture, besides conventional signs, perhaps phonetic. Similar scribings are recorded in Finland, Portugal, and Switzerland. In Scandinavia, later in date, ploughs are intermingled with boats and sun-symbols (Tegneby). There are survivals in S. Africa, Australia, and elsewhere. See Art., Prehistoric; Assyria; Newgrange.

Rock Springs. City of Wyoming, U.S.A., in Sweetwater co. It is 258 m. W. of Laramie on Bitter Creek and the Union Pacific Rly., contains a state hospital, city hall, and public library, and is a centre for a growing trade in cereals and cattle. Lignite deposits support a mining pop. which includes 47 nationalities. Pop. 9,827

Rock Temple. Place hewn out of solid rock for religious uses. Four types occur. When denoting an excavation the term is interchangeable with cave temple. The excavation may be associated with an exposed rock-cut work. Thus the 12th century Gal Vihara at Polonnaruwa, Ceylon, has a recumbent Buddha, 46 ft. long, outside. The cliff side may be cut back, and the central mass sculptured into an open-air temple. The finest are the 8th century Kailas temple at Ellora, Hyderabad, a

richly sculptured pyramidal mass 100 ft. high, and a contemporary temple at Dhamnar, Rajputana. An exposed rock may be carved into a monolithic temple. See Cave Temple; Petra; Temple.

Rocky Mountain Goat (*Oreamnus* or *Haploceros montanus*). Goat-like mammal, found only in



Rocky Mountain Goat. White-coated mammal found in the mountain fastnesses of N. America

W. S. Berridge, F.Z.S.

N. America. It occupies a doubtful position between the goats and the antelopes. In size it resembles a large sheep, and is covered with long white hair. The horns are black, about eight ins. long, and rise from the forehead with a slight backward curve. It is found only in the most inaccessible parts of the mountains, and lacks the wariness of the true goats.

Rocky Mountains. Name in general use for the mountain system which stretches the whole

length of N. America from Alaska to the isthmus of Tehuantepec. Strictly, however, the name should be limited to the E. ridge of this complicated Cordillera, to the section of mountains abutting upon the plains which comprise the middle of the continent. In this restricted sense the Rockies vary in width from 20 to 60 m.; and in general they divide the Pacific drainage from that flowing over the central plains, although the Peace and Liard, in Canada, the Missouri and some of its tributaries, and the Rio Grande, in the U.S.A., rise to the W. of the ridge.

The range may be considered in four sections: N. of the Peace river, between the Peace and the Missouri, between the Missouri and the Rio Grande, and S. of the Rio Grande. In the N. section the Endicott Range, in Alaska, lies between the Yukon river and the Arctic Ocean; farther S. the Mackenzie Mts., the Selwyn Mts., and the Logan Range flank the lowlands of the river Mackenzie; in the Logan Range, Mt. Hunt rises to 9,000 ft.; the peaks in this section are in general below 8,000 ft.

Between the Peace and the Missouri lie the S. Canadian Rockies in a steep ridge N.W.-S.E. parallel to the upper valleys of the Fraser and Columbia rivers; there are considerable areas over 10,000 ft., and many notable peaks. Here are the rly.-traversed Crow's Nest and Kicking Horse passes, 5,500 ft. and 5,300 ft. respectively. S. of the Canadian border this section is continued at a lower elevation as the Kootenay Mts.

The main area of the U.S. Rockies is the broadest part of the system. In N.W. Wyoming is the

volcanic yellowstone region, with Mt. Washburne, 11,350 ft., and the Teton Range with Grand Teton, 13,690 ft.; farther E. lie the Big Horn Mts., and farther S. the Wind River Mts., with Fremont's Peak, 13,781 ft. In the S. of Wyoming the ridge becomes a lofty plateau, the Laramie Plains, which form a connexion with the ranges of Colorado, where Blanca, 14,390 ft., Pike's Peak, 14,108 ft., and Long's Peak, 14,271 ft., reach the highest points of the true Rockies. From Colorado S. the elevation decreases to the Rio Grande, though Truchas Peak, N.E. of Santa Fé, reaches 13,156 ft. In the S. section, within Mexico, the Rockies continue as the Sierra Madre Oriental.

S. of the Canadian border many peaks bear a considerable snow cap, although this is insufficient to give rise to glaciers and may entirely disappear in a hot summer. In Canada, however, the Rockies are more Alpine in character; there are extensive icefields, and Victoria, Lyell, Mangin, Pétain, and many other glaciers; while Lake Louise rivals in beauty the Alpine lakes. The highest peaks are Mt. Robson (12,972 ft.) in the N. and Mt. Assiniboine in the S. Little is known of the region N. of Mt. Robson, where thousands of sq. m. of mountainous country is virtually unexplored. It was in this region that Haworth in 1916, following the Finlay river, discovered the high peaks which he called the Lloyd-George range. Other lofty groups, seen by aircraft during the construction of the Alaska highway, were named Mrs. Churchill, Roosevelt, and Stalin. Coniferous forests clothe the slopes, the timber line reaching 10,000 ft. in the central portions. Grizzly bears, big-horn sheep, the Rocky Mountain goat are among the fauna.

In total length the Rockies stretch through 50° of latitude, with a general bearing to the N.W. from long. 100° W. to long. 150° W.; this implies a total length in excess of 4,000 m. Within the scope of the system are many elevated fertile valleys to which the name park is given, e.g. Luis Park, drained by the Rio Grande, and Yoho Park, near the Kicking Horse Pass. See Canada; Manitou; United States.

Rococo (Fr. *roc*, rock). In architecture and decoration, the name given to a style that prevailed in France and elsewhere on the Continent from the middle of the 17th century to the end of the 18th. It consists of an excessive



Rococo. Capital of a column in rococo style

with an entire disregard of the constructional character of the design. The term has come to be applied to anything extravagant and tasteless in style.

Rocroi. Town of France, in the dept. of Ardennes. It stands near the Meuse, 15 m. N.W. of Mézières and 2 m. from the Belgian frontier. First fortified in the 16th century, the present fortifications, built by Vauban, nearly surround the town, which consists of a central square from which streets radiate to the ramparts. The church is an 18th century building. Pop. est. 2,000.

Rocroi is chiefly famous for the battle that was fought near it during the Thirty Years' War. It was fought on May 19, 1643, between the French under Condé, then duke of Enghien, and the Spanish under de Melo and Fuentes. The latter, about 27,000 strong, were besieging Rocroi, and battle was delivered by Condé, who commanded some 22,000 men. At first the French left wing and centre suffered repulse, but the Spaniards failed to pursue their advantage, and the French left and centre were able to re-form and attack the infantry formation of Fuentes. After four assaults they succeeded; Fuentes was slain, and the Spaniards were routed with a loss of over 7,000 killed and 7,000 prisoners. French losses were about 2,000 killed and 2,000 wounded. See Thirty Years' War.

Rod. Straight, slender shoot or branch of a tree used as an instrument for measuring, chastisement, fishing, cleaning pipes, etc., and as an emblem of office. As the last it is still used by churchwardens, by an official of the royal household, and by ushers of the chief British orders of knighthood, who are called black or green rod from the colour of the wands they carry.

Rod, POLE, OR PERCH. Measure of length and area. Lineally, it is 5½ yds., or 16½ ft.; as a sq. rod, pole, or perch, it contains 30½ sq. yds., or 272½ sq. ft.; 160 rods equal one acre. The sq. rod is used largely in measuring brickwork.

Rod, ÉDOUARD (1857–1910). Swiss novelist. Born at Nyon,

use of curves, irregular disposition of doors and windows, and superabundance of ornament, imitating rock work and shells, and introduced

March 31, 1857, he studied at Bonn and Berlin, and lived for many years in Paris, where he edited *La Revue Contemporaine*. His early novels, e.g. *La Femme de*

Henri Vanneau, 1884, were influenced by Zola, but his later works were marked by a rather morbid pessimism and critical introspection. Among his other novels may be mentioned *La Vie Privée* de Michel Teissier, 1893, and *Les Unis*, 1909. He did much to introduce Tolstoy and Ibsen to French readers, and was professor of comparative literature at Geneva, 1886–93. He died at Grasse, Jan. 29, 1910.

Rodbertus, JOHANN KARL (1805–75). German economist and socialist. Born at Greifswald on Aug. 12, 1805, he studied law at Göttingen and Berlin, and held posts in the judiciary at Breslau and Oppeln, 1828–32. Thereafter



Johann Rodbertus, German economist

he devoted himself to working out his theory of evolutionary and scientific socialism, opposing the internationalist and materialist doctrines of Marx. Elected to the Prussian assembly for Usedom-Wollin, 1848, he was for a short time minister of education, and was elected to the second chamber in 1849. He died Dec. 6, 1875.

Rodenbach, GEORGES (1855–98). Belgian poet and novelist. Born at Tournai, July 16, 1855, he was educated in Paris and at Ghent university, and became a member of the Belgian bar in 1885. His main interests, however, were literary, and his first verses, *Le Foyer et les Champs*, appeared in 1877. Other volumes included *Les Tristesses*, 1879; *Le Règne du Silence*, 1891; *Les Vies Encloses*, 1896. His poetry reflects the quiet melancholy of the towns and country of Flanders, which he knew intimately, and his novel, *Bruges-*



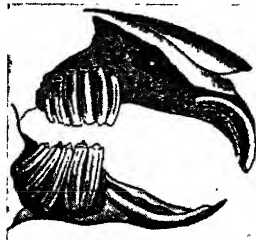
Edouard Rod, Swiss novelist



Georges Rodenbach, Belgian poet

la-Morte, 1892, is a striking study of that city's life. He settled in Paris, 1887, dying there Dec. 25, 1898. He should not be confused with the Flemish poet, Albrecht Rodenbach (1856-80).

Rodent (Lat. *rodere*, to gnaw). Animal belonging to the Rodentia family. In them the teeth are



Rodent. Diagram showing arrangement of teeth in the hare

specialised for gnawing hard substances. There is usually only one pair of incisors in each jaw, but these teeth are largely developed and are chisel-shaped. As they have enamel on their outer side only, use tends to keep the edges very sharp. They continue growing throughout life, so that if one is lost or destroyed, the opposite one continues to grow till it may enter the other jaw, or may so curve as to prevent the mouth from opening. In other animals it curves round and assumes the form of a monstrous tusk. The canine teeth are always absent, and there is a considerable gap between the incisors and the molars. In most rodents the claws are blunt and somewhat broad, and the animal does not rest on them when walking.

As their dentition indicates, nearly all the rodents are strictly vegetarian in diet, roots, stems, and nuts constituting a large part of their food. The great majority of them burrow in the ground, though some are arboreal and a few aquatic. Hibernation is a common habit in this family, while many species store up large provisions of food for the winter. Among the rodents are included the squirrels, marmots, beavers, jerboas, rats, mice, hamsters, voles, lemmings, porcupines, agoutis, caviars, hares, and rabbits. They are world-wide in distribution. See Capybara; Coypu; Musquash.

Rodent Ulcer. Form of cancer of the skin. It is generally restricted to elderly persons, and most frequently affects the face, particularly the forehead or the skin around the eye. The condition begins as a small papule which ultimately ulcerates. Progress is

usually very slow and painless. Gradually, however, the ulceration increases until it may involve a large area of the skin and eat into the underlying structures. Treatment by X-rays or radium, particularly in the early stages, is very effective, and as a rule complete cure can be obtained. Where there has been much destruction of the deeper tissues, surgical removal of the diseased structures may be undertaken in association with radium or X-ray treatment.

Rodeo. Spanish-American term for the driving together of cattle for counting; a round-up; also the enclosure in which branding and counting takes place. The term is popularly used for a "Wild West" exhibition of trick riding of horses and steers.

Roderic. Visigothic king of Spain. His defeat by the Saracen Tarik at Jerez de la Frontera, near the Guadalete, put an end to his brief reign (710-711) and to the Gothic kingdom in that country. Nothing is known of his subsequent fortunes or of the date or manner of his death, and numerous legends have gathered round the name of Don Rodrigo.

Roderick (c. 1116-98). King of Ireland. Son of Turlough O'Connor (1088-1156), he succeeded his father as king of Connaught in 1156, and was crowned king of Ireland at Dublin in 1166. By a treaty with Henry II, 1175, Roderick acknowledged the English king as his overlord, retaining his hereditary kingship of Connaught. Deposed by his half-brother, Cathal, 1191, he died in monastic retreat at Cong.

Roderick Random. Novel by Tobias Smollett, published in 1748, in which he embodied much of his experiences as a naval surgeon's mate. The full title is *The Adventures of Roderick Random*.

Rodez. Town of France, capital of the dept. of Aveyron. It stands on a hill, 2,075 ft. alt., on the right bank of the Aveyron, 37 m. N.E. of Albi. The Gothic cathedral of Notre Dame, built between 1277 and 1535, has a tower 260 ft. high. There are manufactures of cloth, linen, and woollen materials, and a trade in cheese and cattle. Rodez was known as Segodunum and became capital of the Rutheni and later of Rouergue. Pop. 20,437.

Rodin, François Auguste (1840-1917). French sculptor. Son of a government clerk, he was born at Paris, Nov. 12, 1840, and at 14 first attended a drawing-school. Failing to enter the Beaux-Arts, he became assistant

to the sculptor Carrier-Belleuse in 1863, the year in which his first important work, *The Man with a*



Auguste Rodin, French sculptor

Broken Nose, was rejected by the Salon. In 1870 he accompanied Carrier-Belleuse to Brussels and assisted with the interior decoration of the Bourse.

Five years later he went to Italy, where he studied the works of Michelangelo and other masters. He returned to Paris in 1877, and to this period belong his *Age of Bronze* and the statue of S. John the Baptist. He then produced a remarkable series of busts, e.g. Antonin Proust, Victor Hugo, and J. P. Laurens, and in 1882 was commissioned to fashion a bronze door for the Musée des Arts Décoratifs, a work upon which he was engaged for almost 30 years, and which was never completely realized. For this great *Porte de l'Enfer*, which derived its inspiration from Dante's *Inferno*, he made many figures such as *The Thinker* (of which there are several versions), *The Kiss*, and *Ugolino*.

Throughout the 1880s and 1890s Rodin was engaged upon groups of sculpture for various cities, e.g. the monument to Bastien-Lepage at Damvillers completed 1889; *The Burghers of Calais*, ordered 1886 and erected at Calais in 1895 (a version in bronze stands in the Victoria Tower Gardens, Westminster); and the statue of Claude Lorrain at Nancy.



Rodez, France. West front of the cathedral of Notre Dame

In 1914 he presented 20 of his works to the British people in token of his admiration, bequeathing his remaining works to France on his death at Meudon, Nov. 17, 1917. The Thinker in bronze was erected over his grave there.

In the Musée Rodin, Paris, are collected many of his finished works, plaster casts, drawings, and studies. He is represented at the Luxembourg by many busts, and at the Victoria and Albert Museum, London, by 16 bronzes (which were part of the 20 works mentioned above), and a version of S. John the Baptist, presented in 1902 by subscribers. Another well-known



Auguste Rodin. The Burghers of Calais, a group erected in Calais, 1895, of which a bronze replica is in the Victoria Tower Gardens, London. Top, right, a version of The Thinker, in front of the Panthéon, Paris

work, L'Homme qui Marche, is at the Farnese Palace, Rome.

During his lifetime Rodin was accused of breaking the artistic tradition. The movement created by him was a revolt against the academic art of his day. He formed his works by planes of light and shade. Unrivalled for his modelling of the human figure, his works are full of dignity, and his nudes have the same feeling of spiritual intensity as is found in the work of Donatello. A feature of his later style, the emergence of figures undetached from the block, he adopted from Michelangelo.

Bibliography. Rodin's own books, Venus, 1912, and Les Cathedrales de France, 1914; Lives by E. Duham, 1903; C. Black, 1905; J. Cladel, 1908; J. Kahn, 1912; C. Maclair, 1918; Personal Reminiscences of Rodin. A. M. Ludovici, 1926; Rodin, R. M. Rilke, Eng. trans., 1946

Roding. River of Essex, England. It rises about 2 m. N.W. of Dunmow, and flows 34 m. in a generally S.S.W. direction, to the river Thames, 2 m. S.E. of East Ham. The lower course has been canalised to Ilford. See Roothings.

Rodney, GEORGE BRYDGES RODNEY, 1ST BARON (1719-92). English sailor. Born in London, Feb. 13, 1719, he entered the navy at the age of 14, and attained the rank of captain in 1742. Constantly at sea and with various commands, he distinguished himself in the battle off Ushant, 1747, and subsequently served on the N.



1st Baron Rodney, English sailor After Reynolds

American station. Promoted to flag rank in 1759, he bombarded Havre in that year, and in 1761, while in command of the Leeward Islands station, captured Martinique, Santa Lucia, Grenada, and St. Vincent. Made a baronet, 1764, he was governor of Greenwich Hospital, 1765-71.

Severely handicapped by poverty and by the refusal of the government to pay eight years' arrears of pay, Rodney spent some time in retirement, but in 1779 was reappointed to the Leeward Islands. He received orders to relieve Gibraltar, and this he performed by utterly defeating the Spanish fleet off Cape St. Vincent, Jan. 16, 1780. Proceeding to the West Indies, he fought several indecisive battles and was superseded in 1781. The following year he returned to the W. Indies, and defeated Grasse off Martinique, April 12, 1782. The French were routed, but Rodney refused to pursue. He was recalled, but was made a baron. He died May 23, 1792.

The barony passed to his son George (1753-1802), whose descendant, George Bridges Harley Guest (b. Nov. 2, 1891), became the 8th baron in 1909.

Rodó, JOSÉ ENRIQUE (1872-1917). Uruguayan writer. The name of Rodó is famous throughout the whole Spanish-speaking world as that of a great writer and thinker. He is the peculiar glory of the republic of Uruguay, in whose capital city, Montevideo, *Trilce Rodó* he was born.



He was professor of literature at Montevideo university in 1898, and director of the national library in 1900. His philosophic writings, notably Ariel and The Mirror of Prospero, take an optimistic and heroic view of life; "as clear as cut crystal" is a fellow critic's description of his literary style. He died in Sicily, May 3, 1917.

Rodosto or TEKIR DAGH. Town and port of Turkey, on the Sea of Marmara, anciently known first as Bisanthe, and then as Rhædestus, and is reputed to have been founded by the Samians. It is about 80 m. W. of Istanbul, has a good roadstead, and does a considerable shipping trade in grain, canary seed, fruit, vegetables, silk cocoons, and silkworm eggs. Pop. est. 35,000.

Rodrigues. Island of the Indian Ocean. It is 350 m. N.E. of Mauritius, of which it is a dependency, and is 18 m. in length and 7 m. in width, with an area of 42 sq. m. Of volcanic origin, and mountainous, its highest point is 1,400 ft. in alt. The soil is fertile and the climate healthy. The chief town and port is Mathurin, with a good harbour on the N. coast. There are two govt. schools. Rodrigues became British in 1814. It is a cable station with connexion to Cocos-Keeling I. (*g.v.*). Pop. 11,885. Consult The Island of Rodrigues, A. J. Bertuchi, 1923.

Roe, SIR (EDWIN) ALLIOTT VERDON (b. 1877). British aircraft constructor. Born April 26, 1877, he was educated at St. Paul's and King's College, London. After going to British Columbia and to sea as a marine engineer, he took up the designing of motors, winning the Daily Mail model aeroplane prize in 1907. Next year he built and flew a full-sized aeroplane on the lines of his model. In 1910 he founded with his brother, Humphrey Verdon Roe (1878-1949), a firm to build Avro aircraft, which were used in the First Great War. The firm later became Saunders-Roe, Ltd. Sir Alliott, who was chairman of Aviation Developments Ltd., was knighted in 1929. H. V. Roe married Marie Stopes (*q.v.*).

Roe, RICHARD. Imaginary name used in English legal procedure.

Roe, SIR THOMAS (c. 1581-1644). English diplomatist. Born at Low Leyton, Essex, and educated at



Sir Thomas Roe,
English explorer

Magdalen College, Oxford, he received an appointment at court in the last year of Elizabeth's reign. He was knighted in 1605. In 1610 he sailed up the Amazon and to the Orinoco, and later made two other voyages to the same quarter in quest of gold. Roe was M.P. for Tamworth, 1614, and next year was sent as ambassador to the court of the Mogul, where he obtained privileges for English merchants which established the foundations of British supremacy in India. He was back in London in 1619. Ambassador to Constantinople, 1621-28, he became a member of the privy council, and M.P. for Oxford university in 1640. He



Roedean School. Public school for girls near Brighton, Sussex

died at Bath, Nov. 6, 1644, and was buried at Woodford. Part of his journal as ambassador to the Mogul was published by Purchas, 1625, and the whole was issued by the Hakluyt Society, 1899, and a revised version, ed. Sir W. Foster, in 1927.

Roebeck, JOHN ARTHUR (1801-79). British politician. Born at Madras, Dec. 28, 1801, he was edu-



John Roebeck,
British politician

cated in Canada. In 1831, having settled in England, he became a barrister, and in 1832 entered parliament as Radical member for Bath. In 1849 he was returned for Sheffield, and, except for the period 1868-74, he sat for that town until his death, Nov. 30, 1879. Roebeck was chairman of the committee appointed at his instigation to inquire into the mismanagement of the Crimean War. In later life he broke with the Radicals and supported Beaconsfield in his Eastern policy. Intimate with Bentham and Mill, he wrote books on the colonies and the Whig ministry. An Autobiography was published 1897.

Roedean School. An English public school for girls, near Brighton. It was founded in 1885, in Brighton, the present buildings on the cliff-top facing the English Channel, 3 m. E. of the town centre, having been erected 1898. There are an upper and a junior school, with resi-

dent accommodation for 260 pupils in four boarding houses, and large playing-fields, including 20 tennis courts, open-air swimming bath, and outdoor roller-skating rink. The school, incorporated by royal charter in 1938, is governed by a council.

Roedeer (*Capreolus capreolus*). Small species of deer. It stands about 26 ins. high at the shoulder, and the colour of the pelt is reddish in summer and olive brown in winter, with a large white patch on the rump. The antlers are about 8 ins. long, and rise almost vertically from the head, usually with three short tines. The head is short and the ears rather large in proportion.

The roedeer occurs throughout most parts of Europe, and is indigenous in Great Britain. It is found in many of the more secluded parts of the Highlands of Scotland and has been known during the 20th century in Cumberland. Near Milton Abbas, Dorset, is a considerable colony, and a few specimens are to be found in other districts. Roedeer frequent woods, visiting their



Roedeer. Male specimen of the small deer that occurs in some parts of Britain
W. S. Heiridge, F.Z.S.

feeding grounds in the open only in the early morning and evening. They are often troublesome in the neighbourhood of farms, and they do great damage by gnawing the bark of the trees. *See Deer.*

Roehampton. Village and parish within the met. bor. of Wandsworth, London. To the W. of Putney Heath, it once formed part of Putney and Mortlake Park, of which, in Charles II's time, the 2nd earl of Portland was lord keeper, and built, in addition to a mansion, Roehampton Park, the private chapel of which forms part of the parish church of Holy Trinity. The property passed by purchase to Christiana, countess of Devonshire, who held here a kind of salon, at which Thomas Hobbes was a familiar figure. Joshua Vaneck, afterwards Baron Huntingfield, pulled down the mansion and built Roehampton Grove. On part of the park was erected the convent of the Sacred Heart. Here is Queen Mary's Hospital, where soldiers maimed in the two Great Wars have been provided with artificial limbs and are trained in handicrafts.

Roehm, Ernst (1887-1934). German politician. He was born at Munich, Dec. 28, 1887, and became a professional soldier, being commissioned just before the outbreak of the First Great



Ernst Roehm,
German politician

War. By 1918 he was a staff officer, and the following year he played a prominent part in von Epps's attempt to overthrow the Left-wing government at

Munich. An early member of the Nazi party and a close personal friend of Hitler, he took part in the abortive putsch of Nov., 1923, and was imprisoned. He was later lt.-col. on the staff of the Bolivian army, but returned to Germany in 1931 to become Hitler's chief of staff and leader of the S.A. and S.S. A member of the Reichstag, he tried to bring about a merger between the regular army and his own organizations. Accused of having plotted against Hitler, he was one of those shot in the "purge" of June 30, 1934.

Röer (Ger. *Rur*, sometimes *Ruhr*). River of Belgium, Germany, and the Netherlands. It should not be confused with the river Ruhr (*q.v.*), Germany. About 125 m. long, the Röer

rises in the Hohé Venn, and flows N.E. past Monschau, then N.W. past Düren, Jülich, Linnich, and Kempen, where it is joined by the Wurm, to enter the Maas at Roermond. Its valley was the scene of violent fighting during the Second Great War. Between Jan. 16 and 28, 1945, the British 2nd army drove the Germans from a salient they held along the left bank of the Röer and the Wurm between Geilenkirchen (captured Nov. 18, 1944) and Roermond. The U.S. 9th army then took over the line about Roermond. Between Feb. 8 and 11 the U.S. 1st army gained control of the W. bank of the Röer from 2 m. W. of Gemund in the S. to 2 m. upstream from Roermond in the N. The 9th army should have attacked between Roermond and Jülich a day or two after Feb. 8, when the Canadians attacked in the Reichswald, farther N.; but on the night of Feb. 9-10 the Germans blew up the dams containing the Röer reservoirs, and the river became impassable. It was still 250 ft. wide (instead of its normal 40-60 ft.) when the 1st and 9th armies struck at 3.30 a.m. on Feb. 23, and in bright moonlight forced a passage of the river. Jülich was taken by storm on the 24th; Düren, reduced to rubble, on the 25th; and with the liberation of Roermond on March 2, the whole of the Röer river was under Allied control.

Roermond. Town of the Netherlands, in the prov. of Limburg. It lies on the right bank of the Meuse, here joined by the Röer, 28 m. by rly. N.E. of Maastricht, and is a rly. junction. It has industries in cloth and tobacco manufacture, and considerable traffic. The town is partly surrounded by promenades built on the site of the old fortifications. The 13th century minster contains some interesting carving. The cathedral of S. Christopher has three main towers and several noteworthy paintings. Fortified from the 13th century, Roermond changed hands several times during the wars against the Spaniards, who were finally expelled in 1702. In 1706 it became the capital of Austrian Gelderland, and from 1793 to 1814 was in French possession. The bishopric, founded 1561, was merged with that of Liège in 1801. Occupied by the Germans from 1940, Roermond was captured by troops of the U.S. 9th army on March 2, 1945 (*see Röer*). Pop. est. 21,415. *Pron. Roormond.*

Rogation Days. Three fast days observed by the Roman

Catholic and Anglican Churches. They are the Monday, Tuesday, and Wednesday before Ascension Day, the preceding Sunday, the 5th after Easter, being known as Rogation Sunday. Mamertus, bishop of Vienne, is said to have instituted processions with litanies (Lat. *rogatio*, an intercession) on these days, on the occasion of earthquakes and volcanic eruptions in his diocese, about A.D. 467. The practice rapidly spread through the Western Church. In the Church of England there are no special prayers for these days, but at this season perambulations of parishes take place, when crops in fields, allotments, gardens, and the sea are blessed. An old name for Rogation days is Gang days, from Anglo-Saxon *gangan*, to go, walk. *See Bounds, Beating the; Litany.*

Roger (1031-1101). Count of Sicily. Son of Tancred of Hauteville, Normandy, he assisted his brother, Robert Guiscard (*q.v.*), to conquer Calabria, 1057-62, and then crossed to Sicily, where he spent the next 30 years in subduing the Muslim rulers. His government of the island was generous and just, and the conquered Arabs eventually became his loyal subjects. On Robert's death in 1085, he succeeded to his dominions on the mainland, dying June 22, 1101.

Roger (c. 1093-1154). King of Sicily. Son of Count Roger, he was an ambitious man, and in 1127 claimed Apulia, the throne of which was vacant by the death of his cousin William. Invested duke of Apulia in 1128, he extended his authority through the S. of Italy, and, as a reward for supporting Pope Anacletus II against his rival, Innocent II, Roger was made king of Sicily. Fiercely subduing insurrection in Sicily and resisting the war-like advances of rival powers from the N., he attacked the Byzantine empire, 1146, ravaged Greece and Dalmatia, and in 1147 conquered parts of N. Africa. He governed his dominions well. He died Feb. 26, 1154.

Rogers, GINGER (b. 1911). American film actress. Virginia Katherine McMath was born at Independence, Mo., U.S.A., July 16, 1911, and after acting in vaudeville started film work in 1931. She went to Hollywood where she was in Young Man of Manhattan, 1931, and afterwards appeared with Fred Astaire (*q.v.*) as his dancing partner in a series of popular films, e.g. The Gay Divorcee, 1935; Roberta, 1935; Top Hat, 1936; Shall We Dance, 1937,

Later she was starred in many "straight" films, some of which attained the same popularity.

Rogers, HENRY (1806-77). British divine. Born at St. Albans, Oct. 18, 1806, he was educated at



Henry Rogers,
British divine

Highbury College. After a few years passed in charge of a church at Poole, he was appointed in 1836 professor of English literature at University College, London. In 1839 he became professor at Spring Hill College, and in 1858 principal of Lancashire Independent College. He retired in 1871, and died Aug. 21, 1877. A powerful thinker, Rogers exercised great influence over his pupils and by his writings, of which *The Eclipse of Faith* is the best known.

Rogers, JAMES EDWIN THOROLD (1823-90). British political economist. Born at West Meon, Hants, and educated at King's College, London, and Magdalen Hall, Oxford, he took orders and worked as a parish priest until 1860, when he threw up his profession and devoted himself to teaching and the study of political economy. While living in Oxford he was four times examiner in classics, and published verse translations from Euripides, Horace, and Juvenal. In 1859 he was appointed Tooke professor of statistics and economic science at King's College, London, a position which he held until his death at Oxford, Oct. 12, 1890. His greatest work, the *History of Agriculture and Prices in England*, was begun in 1860, the first two volumes being published in 1866, and he was appointed in 1862 Drummond professor of political economy at Oxford. During 1880-86 he was in parliament as a Gladstonian Liberal, and in 1888 was re-elected Drummond professor at Oxford.

His *History of Agriculture* is a monumental record of research for the English period, 1259-1793. It was supplemented by the equally important *Six Centuries of Work and Wages*, 2 vols., 1884.

Rogers, JAMES GUINNESS (1822-1911). British divine. Born

at Enniskillen, Dec. 29, 1822, the son of the Rev. Thomas Rogers, he was educated at Wakefield, at Trinity College, Dublin, and for the ministry at Manchester. In 1846 he became minister of a Congregational church at Newcastle-upon-Tyne, afterwards having charge of churches at Ashton-under-Lyne (1851-65), and Grafton Square, Clapham (1865-1900). He died Aug. 20, 1911. Rogers was perhaps better known as a political speaker than as a preacher. A strong Liberal and a friend of Gladstone, he was one of the champions of Nonconformist and Liberal causes.

Rogers, JOHN (c. 1500-1555). English martyr. He was born at Aston, Birmingham, and in 1534 became an associate of William Tyndale. After serving as pastor of a Protestant church at Wittenberg, he became in 1550 rector of St. Margaret Moyses and St. Sepulchre in London. His great work was his translation of the Bible, which had considerable influence on the translations of the authorised version of 1611. He was burned to death at Smithfield Feb. 4, 1555, the first Protestant martyred by Mary I.

Rogers, SAMUEL (1763-1855). British poet. Born at Stoke Newington, July 30, 1763, he



Samuel Rogers,
British poet

entered his father's bank as a youth, and became head of it in 1793. His leisure was devoted to the cultivation of literature, and by 1792 he had established his fame as a poet with the very successful *Pleasures of Memory*. About this time Rogers took rooms in the Temple and soon had a large circle of acquaintances among the leading literary men of the day. The circle was further extended when he withdrew from active management of the bank.

Rogers's breakfasts became famous, the conversational powers of the host himself contributing not a little to their success. Among his friends were numbered Byron, Campbell, Moore, Wordsworth, Jeffrey, Fox, and Sheridan. At St.



J. Guinness Rogers,
British divine

James's Place, also, he began to amass the magnificent art collection and library which after his death were sold for £50,000. Exceedingly fastidious in his work, Rogers's literary output was comparatively small. His poems include, in addition to *The Pleasures of Memory*, *Columbus*, 1810, a fragment of an epic, *Jacqueline*, 1814, *Human Life*, 1819, probably the best of his works, and *Italy*, 1822, the third edition of which, published in 1830, was illustrated by Turner and Stothard. The lack of original genius in his works is compensated for by his exquisite taste and laborious artistry. Personally Rogers was one of the kindest and most benevolent of men, though his amiable qualities were somewhat obscured by his caustic wit. He died Dec. 18, 1855.

Rogers, WILLIAM PENN ADAIR (1879-1935). American comedian. Born Nov. 4, 1879, at Oolagah, Indian Territory, he went during the South African War to S. Africa, where he toured in vaudeville. In 1905 Will Rogers first appeared in New York as a humorist who was to win international reputation on stage and screen, as well as in journalism. He started film work in 1918, and acted in *A Yankee at the Court of King Arthur*, *So This is London*, *State Fair*, and *Handy Andy*. He was accounted the wittiest talker in Hollywood, and his newspaper comments were widely read. He was killed in an air crash while flying with Wiley Post between Alaska and Siberia in mid-Aug., 1935. Consult Will Rogers, P. O'Brien, 1936.

Roger's Pass. Mountain pass in Canada, in British Columbia. Here the C.P.R. crosses the Selkirk Mts. Its altitude is 4,275 ft.

Roget, PETER MARK (1779-1869). British scientist of Huguenot descent. Born in London, Jan.

18, 1779, and educated for the medical profession at Edinburgh university, he had a long and busy career, first in Manchester and afterwards in London, as a physician and lecturer on physiology and other medical subjects. A versatile and industrious man, with a strong scientific bent, Roget helped greatly in the establishment of the university of London, in which he retained his interest



Peter Mark Roget,
British scientist

throughout his life. He discovered, 1824, the phenomenon of persistence of vision, on which the cinema is based. He is chiefly remembered, however, by his enormously popular *Thesaurus of English Words and Phrases*, 1852, later often revised. He died at Malvern, Sept. 12, 1869. *Pron.* Rozh-ay.

Rogier, CHARLES LATOUR (1800-85). Belgian statesman. He was born at St. Quentin, Aug. 12, 1800, and was educated at the *lycée* of Liège. In the revolution of 1830 by which Belgium was freed from Holland, he raised a company of men of Liège and took an active part



-Charles Rogier,
Belgian statesman

in the fighting in Brussels, afterwards becoming a member of the provisional government and of the national congress. Minister of the interior in 1832 and of public works in 1840, he was anti-clerical and anti-republican, supporting the constitutional monarchy. He was twice governor of Antwerp and became the head of the Liberal ministries of 1847-52, and 1857-68. As minister of foreign affairs in the latter period he strengthened the good relations of Belgium with France, negotiating a treaty of commerce between them. He also obtained from Holland and Great Britain the suppression of the Schelde tolls which hampered the commerce of Antwerp. He died in Brussels, May 27, 1885. *Consult* Life, E. Descailles, 1896. *Pron.* Rozh-yay.

Rogue. Term used for a dishonest person, also for a vagrant. Rogue money was a phrase used in Scotland for the money levied in each county to meet the cost of catching, prosecuting, and maintaining criminals (*see* Vagrancy). A rogue elephant is one not attached to any particular herd, and is usually savage.

Rohan-Gié, HENRI, DUC DE (1579-1638). French soldier. Born at Blain, Brittany, Aug. 21, 1579, he was educated as a Protestant and served his kinsman Henry IV at the siege of Amiens, 1597. Created duke in 1603, he attended the Protestant



Duc de Rohan-Gié,
French soldier

assembly at Saumur, 1611, and became leader of the Calvinist party, fighting against Louis XIII in Béarn, 1620. Raising the sieges of Montauban and Montpellier, 1622, he helped to secure the confirmation of the edict of Nantes, 1623, and became governor of Nîmes and Uzès. He fought against Richelieu at La Rochelle, and after the peace of Alais, 1629, retired to Venice and wrote his memoirs. He commanded a French corps against Austria, 1635-36, and, wounded while fighting for the Protestants at Rheinfelden, Feb. 28, 1638, died, April 13, at Königsfeld.

Rohan-Guéméné, LOUIS RENÉ ÉDOUARD, PRINCE DE (1734-1803). French cardinal. Born in Paris, Sept. 25, 1734, he was educated at the seminary of S. Magloire, and became coadjutor to his uncle Constantine, bishop of Strasbourg, 1760. He was admitted to the *Académie Française*, 1761, and in 1772 went to Vienna as ambassador. His extravagant luxury there displeased Maria Theresa, who secured his recall, 1774. He became cardinal, 1778, and bishop of Strasbourg, 1779. He fell into disgrace on account of his implication in the affair of the diamond necklace (*q.v.*), 1785, and was arrested, but on release returned to Strasbourg. He died at Ettenheim, Feb. 17, 1803.



Prince de Rohan-Guéméné,
French cardinal

Rohilkhand. Dist. of India, now part of Oudh. It owes its name to the Rohillas, who were crushed by some British troops in 1774. It then became part of Oudh and was annexed by Great Britain in 1801. *See* India; Oudh.

Rohilkhand. Division of the Uttar union, India. It is situated E. of the Ganges and W. of Nepal at the foot of the Himalayas. Its area is 10,665, sq. m. Pop. 6,195,996.

Rohilla. People of Afghan race. Early in the 18th century they came down from the borders of Afghanistan and settled in a territory to the N.W. of Oudh, to which the name Rohilkhand was given. There they came into conflict with the Mahrattas, against whom they secured the help of the nawab of Oudh, Suraj-ud-Dowlah. For this assistance the Rohillas promised 40 lacs of rupees to the nawab, who had apparently got rid of the

Mahrattas by a monetary payment. The Rohillas discharged only a portion of their debt, whereupon the nawab made a bargain with Warren Hastings, who, in return for a sum of money paid to the E. India Co., promised to send a force against the Rohillas. The result was the short war of 1774, in which the tribesmen were quickly crushed. His conduct in this matter was one of the charges on which Hastings was impeached. *See* Hastings, W.; Suraj-ud-Dowlah.

Rohlf, FRIEDRICH GERHARD (1831-96). German explorer. Born at Bremen, April 14, 1831, he served in the Slesvig-Holstein campaign of 1848, and then studied medicine and joined the French foreign legion as a surgeon. After serving in Morocco, 1861-62, he disguised himself as an Arab and made various desert explorations. In 1863 he reached the oasis of Tuat, and in 1865 he crossed Tripoli, S. Bornu, and Sokoto, and eventually made his way to the Guinea coast. During 1868-75 he made other explorations in the African deserts, which he described in *Reise durch Marokko*, 1868; *Land und Volk in Afrika*, 1870; *Reise von Tripolis nach der Oase Kufra*, 1881. He died June 2, 1896.

Rohtak. Dist. and town of Punjab state, India. The dist. lies W. of the Jumna and N.W. of Delhi; the Sonapat subdivision was added to it on the partition of the Delhi division. The chief tribesmen are Jats. Rainfall is 29 ins. per annum, and the chief crops are native food grains, *e.g.* bajra, although some cotton and sugar-cane are grown. Its area is 1,800 sq. m. The town, of great antiquity, occupies a central position in the dist. and is on the rly. N.W. from Delhi. Pop., dist., 956,399; town, 37,000.

Roi Fainéant (Fr., do-nothing king). Term applied to the last seven Frankish kings of the Merovingian dynasty. They were so called because the officials known as the mayors of the palace, at first servants, gradually assumed royal power. *See* Franks; Merovingians.

Rokeby. Romantic narrative poem by Scott, published in 1813. The scene is Rokeby in Yorkshire, 3 m. S.E. of Barnard Castle, where the poem was written, and the period is July, 1644, immediately after the battle of Marston Moor.

Rokossovsky, KONSTANTIN (b. 1887). Russo-Polish soldier. Born in Warsaw (then in Russia) he served in the tsarist army in 1914-17, but at the Revolution joined the Bolsheviks. When Russia was

brought into the Second Great War in 1941, he was lieutenant, and commanded an army defending



K. Rokossovsky,
Polish soldier

Moscow. In the battle of Stalingrad, 1942-43, he was commander of the army of the Don; he was later commander of the 1st and then of the 2nd White Russian armies, directing operations in Poland, and cooperating in the conquest of E. Prussia, 1944-45. Promoted marshal, 1944, he became in 1949 Polish minister of national defence and supreme cmdr. of armed forces, taking Polish citizenship.

Roland. Frankish soldier, celebrated in legend as the greatest of Charlemagne's paladins. The historic Roland or Hrudodland was an obscure warden of the Breton marshes, who was slain by the Basques when they overwhelmed the rearguard of Charlemagne's army on its return from an expedition against the Moors of Spain in 778. The attack, which was made at Roncesvalles in the Pyrenees, was in retaliation for the wanton capture of Pampeluna. Popular tradition, embodied in the Song of Roland and other poems, transformed Roland into a national hero, the nephew of Charlemagne, and his assailants into Saracens. As Orlando, Roland is the hero of Ariosto's Orlando Furioso and Boiardo's Orlando Innamorato.

Roland, SONG OF (Fr. *Chanson de Roland*). National French epic, the oldest and finest of the extant *chansons de geste* (q.v.). Written probably by a Norman, between 1066 and 1099, it consists of 4,001 ten-syllabled lines, grouped by assonance into sections. Based on distorted memories of the disaster at Roncesvalles, it is heroic in spirit, and its austere, direct style, devoid of superfluous ornament, has little in common with the romantic manner of later poems. It tells how Charlemagne, after conquering Spain, accepts the feigned submission of the Saracen king, Marsile. See Charlemagne. Consult ed. with modern French version by L. Gautier, Eng. trans. Scott-Moncrieff, 1920.

Roland de la Platière, MARIE JEANNE PHILIPON (1754-93). French writer and revolutionary leader. She was born in Paris, March 18, 1754, and in 1780 married Roland de la Platière, husband and wife becoming prominent among the

Girondist leaders. Madame Roland's letters and memoirs throw much light on the period, and reveal her as one of the finest characters and one of the most brilliant intellects of her time. She was guillotined in Paris, Nov. 8, 1793. Her last words have become famous: "Oh, Liberty, what crimes are committed in thy name!" Her *Mémoires*, first published in 1820, and her *Lettres*, 1867, have been



Madame Roland de la Platière. From a drawing made at the Conciergerie prison, while she was awaiting execution

many times reissued. There was a new edition of the letters, edited by C. Perroud, 1900-02, and of the *Mémoires*, 1905. Consult Lives, M. Blind, 1886; I. M. Tarbell, 1896; I. A. Taylor, 1911; C. Young, 1930; M. P. Willcocks, 1936.

Roll (Lat. *rotula*, a little wheel). Term which has come to be used primarily for that which is rolled, or wound upon a roller, e.g. a roll of paper. In nautical phraseology the roll of a ship implies tossing from side to side as opposed to pitching from bow to stern. Calling the roll means calling over a roll or list of the names of a body of persons to ascertain which are present. The word roll is also used to describe an acrobatic manoeuvre in which a complete revolution about the longitudinal axis is made by an aeroplane. During a roll the aeroplane rotates laterally through 360°, but the actual path is a horizontal corkscrew. In cookery the term roll is applied to any food rolled up in preparation for use such as bread formed by rolling, sausage-meat rolled in pastry, jam or Swiss roll, etc. In music, by analogy, a roll is the continuous vibration of the drum head obtained by rapid strokes of the

drum sticks, usually indicated as a trill or tremolo. There are several kinds of roll on the side-drums, according to the way in which the sticks are used. It applies also to a "catch" or roll in song, e.g. "singing a gay roll."

The master of the rolls is the legal official in charge of reports and documents, formerly inscribed on rolls of parchment.

Rolland, ROMAIN (1866-1945). French writer. Born at Clamecy, Nièvre, Jan. 29, 1866, and educated at the École Normale, Paris (where in 1897 he was appointed lecturer in the history of art) he held a chair at the Sorbonne during 1903-10, resigning to devote himself to writing. His series of novels under the general title of Jean Christophe in 10 vols., written during 1904-12, for which he received the Nobel prize for literature in 1915, placed him among leading French novelists. Of this great work (which he described as "the tragedy of a generation that had disappeared") the first three vols. took their place among the best works in French literature.

Rolland was an avowed pacifist, and became unpopular in France during the First Great War. He later became a disciple of Indian religious and philosophical thought and his works on Ramakrishna and Vivekananda created for him an international reputation as a religious leader. Of his plays—never popular in France—the best-known were *Danton*, and *Le 14 Juillet*. He was also a distinguished critic and historian of music, writing biographies of Beethoven, 1903, and Handel, 1916. He died Dec. 30, 1945. Consult Life, S. Zweig, Eng. trans., E. and C. Paul, 1921.

Rolle, RICHARD (c. 1290-1349). English hermit. Born at Thornton, Yorks, he led a solitary existence from the age of 19, at Hampole, near Doncaster. Here he dedicated himself to a religious life, writing treatises and songs in the Northumbrian dialect which were widely read by scholars, and which are now of considerable interest to philologists. His most popular work was *The Pricke of Conscience* which was published, ed. by R. Morris, 1863. He died Sept. 29, 1349. Consult Life by F. M. M. Comper, 1929; English Writings of R. Rolle, ed. H. E. Allen, 1931.



Romain Rolland.
French author

Roller. Group of birds, including several genera, which are widely distributed throughout the E. hemisphere. In general appearance they resemble crows, but have plumage of very brilliant colours. One species, the blue roller (*Coracias garrulus*), breeds in S. Europe, and occasionally visits Great Britain. It is like a jay, has chestnut brown and blue plumage, and is about 12 ins. in length. The name is derived from the peculiar habit of these birds of appearing to lose balance and roll over when in



Roller, the blue species which visits Great Britain

flight, especially by the males during the courting season. The name roller is also given to certain varieties of tumbler pigeons, e.g. Oriental roller. See Pigeon.

Roller. Machine for levelling ground. There are three main types of roller: road, garden or lawn, and agricultural. The heaviest is the road roller, which varies between 2½ and 20 tons in weight and may have a steam, petrol, or Diesel engine. The first practical road roller was built in France in 1787 and, made of cast iron, was 3 ft. in diameter and 8 ft. wide. It weighed 1½ tons and was drawn by four horses. In 1817 a horse-drawn road roller was patented in England by Philip Clay. In 1859 the first steam road roller was patented by a French engineer, and in 1863 came one by Walter Batho of Birmingham. Basically, a road roller is a tractor with a steel cylinder to replace the front steering wheels, while the rear wheels have large diameter and great breadth. The rolling cylinder is usually in two sections to facilitate steering. The function of the road roller is to compress the road metal so that the jagged edges of the stones interlock and solidify into the binder, and to press the material forming the surface so that it interlocks with the lower course and is level.

Agricultural rollers may be horse- or tractor-drawn. For clod crushing, bar or tubular rollers are used; also, when the ground is particularly heavy, crossbill rollers.

which may be fluted or in serrated rings. Sub-surface or land-presser rollers consolidate the soil at the bottom of furrows. A combined clod-crushing and soil-consolidating roller—Cambridge roller—has several rings, 2–3 ins. wide, which taper to a point. Flat or land rollers smooth the surface of a field after sowing, and may be of steel, wrought iron, wood, or stone; they are commonly 7 ft. wide and 18 ins. in diameter and weigh up to 12 cwt.

Roller Bearing. Type of machine bearing in which tapered or parallel rollers are interposed between the shaft and its support to lessen friction. See Bearing.

Roller-Skating. Pastime of skating on wheels, usually on a floor of polished wood or cement. This form of skating was in vogue in the U.K. as early as 1800, but was not publicly exploited until 1815, at the Floral Hall, Covent Garden, London. At first a fixed axle type of skate was used, but with the inclined axles principle and four wheels to each skate, introduced from America in 1863, the execution of figures on roller-skates became possible. In 1879 the National Skating Association was formed to promote the sport; and in 1890 the Olympia hall, at West Kensington, was opened as a roller-skating rink. With the advent of the ball-bearing skate the pastime increased in favour. There are British amateur and professional championships for roller-skating at speed. See Skating.

Rolleston, THOMAS WILLIAM (1857–1920). Irish author. Born at Glasshouse Shinrone, Offaly, he was educated at Rathfarnham and Trinity College, Dublin. He edited The Dublin University Review, 1885–86, and published a Life of Lessing. 1889. He was interested in the development of

Irish arts and crafts, industries, and trade. He also took a prominent part in the Irish literary



Thomas W. Rolleston, Irish author Elliott & Fry

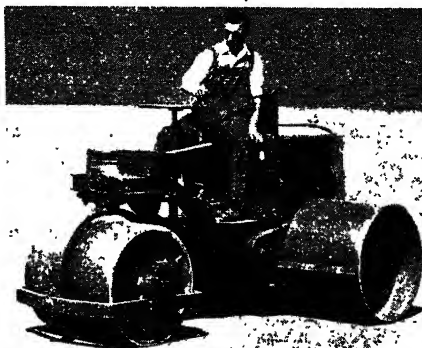
revival, acting as joint editor of The Treasury of Irish Poetry, 1900, and writing Imagination and Art in Gaelic Literature, 1900, and Myths and Legends of the Celtic Race, 1911. His other works include Parallel Paths: a Study in Biology, Ethics, and Art, 1908; and Sea Spray, poems, 1909. He died Dec. 5, 1920.

Rolliad, THE. Political satire in verse and prose, published in two parts in The Morning Herald, 1784–85. Its full title is Criticisms on the Rolliad, and the skit comprised extracts from an imaginary epic poem, these giving opportunity for caustic comments on contemporary men and matters. The immediate occasion of the satire was a speech made by Col. John (afterwards Lord) Rolle (1750–1842) on the Westminster Scrutiny, when the government attempted to unseat Fox; but the attack was mainly directed against Pitt and the members of his government. The Rolliad, a brilliant ephemeral performance, was the joint production of several Whigs.

Rollin, CHARLES (1661–1741). French historian. Born at Paris, Jan. 30, 1661, he was educated at the college of Plessis and studied theology. He became professor of eloquence at the Collège de France, 1688, rector of the university, 1694–96, and principal of the college of Beauvais, 1699–1712. He exercised great intellectual influence, but was accused of Jansenism

and obliged to retire, though he continued to teach at the Collège de France. His writings include Traité des Études, 1726–31; Histoire Ancienne, 1730–38; and the uncompleted Histoire Romaine, 1738. He died Sept. 14, 1741. His complete works were edited by Guizot, and published during 1821–27.

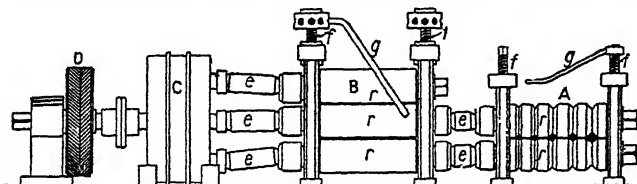
Rolling Mill. Machine used for rolling plates, sheets, bars, angles, etc., from cast ingots or



Roller. A heavy motor roller used for preparing cricket pitches and keeping them in good order

billets of metal. The simplest form consists of a single "stand" of two rolls (see A, Fig. 1), usually made

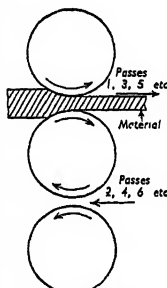
only part of the complete operation. The amount of reduction in each is limited by the diameter



Rolling Mill. Fig. 1. Diagram of 2-high bar mill and 3-high plate mill. A. Bar mill. B. Plate mill. C. Gear box. D. Driving wheel. e. Mill couplings. r. Rolls. f. Pressure screws. g. Handles for screwing up rolls

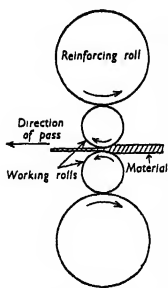
from cast iron and held, one above the other, in adjustable bearing housings. The rolls are geared so that they revolve at equal speeds, with the inner faces moving in the same direction, when they are driven by an engine or electric motor acting through a reduction gear. In operation the rolls are moved closer together between each passage of the metal, to give a maximum amount of reduction, a series of passes being used to give the desired total reduction.

Parallel rolls produce flat, rectangular cross-sections, but grooved formers are needed for sections of other shapes. For heavy work the rolls may be reversible, or a three-roll mill, called a three-high mill (see B, Fig. 1), may be used. With the latter, one pass is made in one direction between the bottom and middle rolls and the next pass in the reverse direction between the top and middle rolls (Fig. 2). With the arrangement shown in Fig. 1 the two-high stand would not be reversible.



Rolling Mill. Fig. 2. Three-high rolls

In such specialised devices as continuous or strip mills, a number of stands, with either two-high or four-high (see Fig. 3) non-reversing rolls, are used and the metal passes in one direction once only through each stand. Each stand performs



Rolling Mill. Fig. 3. Four-high rolls

of the rolls, and there is an economic limit to the size of mill which can be usefully employed. In a four-high mill the two large outer rolls act only as reinforcing and stiffening rolls, and the actual reduction is performed between the relatively small inner rolls. This type is more efficient and cheaper to maintain on continuous heavy work than a corresponding two-high or three-high mill, owing to the lower maintenance costs of the small working rolls.

Rollo, ROLF, OR ROU (c. 860-932). Duke of Normandy. Son of Rognvald of Norway, he left that country c. 875, took part in invasions of Scotland and England, and sailed up the Seine to Jumièges and Rouen, 876. Fortifying Rouen, he extended his power in Neustria, besieged Paris, 886, and captured Évreux, Bayeux, and other towns. By the treaty of St. Clair-sur-Epte, 911, Rollo was baptized as Robert at Rouen, his capital, is said to have married Gisèle, daughter of the king, and received the territory thereafter called Normandy and the suzerainty of Brittany. His strong, able rule brought prosperity. Abdicating in favour of his son William in 927, he died in 932.

Rollo, BARON. Scottish title borne by the family of Rollo since 1651. Sir Andrew Rollo, whose estates were at Duncrub, Perthshire, was the first holder, Charles II creating him a baron during his stay in Scotland in 1651. Robert, the 4th baron, was concerned in the Jacobite rising of 1715, and from him the title passed from one descendant to another until in 1947 it came to Eric John Stapylton, as 13th baron. Lord Rollo sits in the lords as Baron Dunning, a title created in 1869. The seat is Pitcairns, Dunning, Perthshire, and the heir to the title is known as The Master of Rollo.

Rollright, GREAT AND LITTLE. Two villages of Oxfordshire, England. They are situated in the

Cotswold Hills, 3 m. N. and N.W. respectively of Chipping Norton, and have a total pop. of about 400. Half a mile from Little Rollright, on the county boundary, are the Rollright Stones, most important megalithic remains in England after Stonehenge and Avebury. The isolated King's Stone and the clustered Whispering Knights are the chief stones left.

Rolls, CHARLES STEWART (1877-1910). British engineer and airman. Born in London, Aug. 28, 1877, a younger son of the 1st Baron Llangattock, he was educated at Eton and Trinity College, Cambridge, where he took part in cycle-racing. After some engineering work at Crewe, Rolls



Charles Stewart Rolls, British engineer Elliott & Fry

devoted his time to popularising the motor-car in England. He competed in races, investigated new designs, and formed for their manufacture the company which became Rolls-Royce, Ltd. About 1901 he turned his attention to aeronautics, and, making many daring flights, was soon one of the best known of British airmen. In 1910 he crossed and recrossed the English Channel in 95 minutes, then a notable feat. He was killed while flying at Bournemouth, July 12, 1910. There is a statue to him at Monmouth, the home of his family.

Rolls Chapel. Former London building. It stood in Chancery Lane, E.C., on ground now covered by the W. part of the Public Record Office (q.v.). The original chapel and house were built by Henry III in 1233 for converted Jews and their governor or master. In 1377 buildings were assigned to the master of the rolls, who held his court here until 1882, and was known until 1873 as keeper of the house of converts. The chapel was rebuilt by Inigo Jones in 1617, and Rolls House during 1717-25. Donne, Burnet, Atterbury, and Joseph Butler were among the preachers in the chapel, interesting monumental remains from which, including the tomb of John Young, master of the rolls to Henry VIII, are in the Record Office museum, with which parts of the old chapel were incorporated during 1896-97.

Rolls-Royce. British motor car and aero-engine manufacturers, with main works at Derby. The firm was founded in 1906 by C. S.

Rolls (*q.v.*) and F. H. (later Sir Henry) Royce. The latter continued as chief designer until shortly before his death in 1933. From the start he insisted on the very finest workmanship, and the Rolls-Royce car soon became world-famous. The earliest Rolls-Royce aero-engines appeared in the First Great War, the most powerful (the 375 h.p. Eagle) remaining in service as the power-plant of the Vickers Vimy and other notable large aircraft. The next advance in design was the Kestrel series, from 1929 onwards. These were progressively developed from 480 h.p. to 745 h.p., and from them derived the racing engine (maximum 2,350 h.p.), fitted to the Supermarine seaplanes which won the Schneider Trophy in 1929 and 1931, and also to record-breaking cars and motor boats. The first R.A.F. monoplane fighters, the Hurricane and Spitfire, were designed in 1935-36 around the then very advanced Rolls-Royce Merlin motor, which played a great part in the early air operations of the Second Great War. (*See* Merlin.) The Griffon (2,000 h.p. and upwards) was a more powerful unit of the same basic design, 12 cylinders arranged in two banks of six, at a 60° Vee angle, liquid-cooled. Rolls-Royce also took over development of the Whittle-type gas turbine for jet propulsion. The successful outcome was the River class of centrifugal-flow turbines; the Welland, Derwent (as fitted to the Meteor fighter, which set up new speed records in 1945-46), and Clyde being notable examples. *See* Aero-Engines.

Roma. Town in Roma co., Queensland, Australia. It is on the Warrego river, 318 m. by rail W. of Brisbane on the line to Cunnamulla. Pop. 3,600.

Roma. Personification of the imperial power of Rome. She was worshipped both in Rome and Asia Minor, where the first temple was built in her honour at Smyrna in 195 B.C. On Roman coins, she was represented as a warlike heroine, leaning on a shield, with the goddess of victory on her right. A temple of Venus and Roma was erected in Rome by Hadrian. *See* Marcus Aurelius.

Romagna. Region of Italy, covering the N.E. part of the former Papal States, and including the modern provs. of Ravenna and Forlì. With the neighbouring region of Emilia, it was acquired by the popes in 1278, was surrendered by them in 1797, and was joined to Piedmont in 1860.

Romains, JULES (b. 1885). French writer. Born at Saint-Julien-Chapteuil, Aug. 28, 1885,



Jules Romains,
French writer

his real name was Louis Farigoule. He was for ten years a professor of philosophy. He was one of the founders of *l'Abbaye* in 1906; this was a literary colony supporting itself on communistic lines, with its own printing-press; it was short-lived, for lack of funds. Romains afterwards founded *Unanimism* (*q.v.*), 1909, for which he wrote a manifesto. Its principles were put into practice in his volume of poems, *La Vie Unanime*, 1908, and successive volumes. As a playwright Romains was amusing and skilful; his *Knock*, 1923, produced in England in 1926 as *Doctor Knock*, was a great success, and it was followed by several others. As a novelist, his outstanding achievement is the series *Les Hommes de Bonne Volonté*, translated as *Men of Good Will*,

which extended to 20 volumes between 1932 and 1941; it is a survey of the contemporary scene. During the Second Great War, he went to America, where he wrote *Sept Mystères du Destin de l'Europe*, 1941, *Une Vie des Choses*, 1941, *Grace encore pour la Terre!*, 1941, *Stefan Zweig, Great European*, 1942, and the play *Salsette Discovers America*, 1942. He was elected to the Academy 1946.

Roman or **ROMANU**. Town of Moldavia, Rumania, the chief town of a department of the same name. It stands at the confluence of the Moldava and the Sereth, about 35 m. S.W. of Jassy. It has a fine cathedral, built in 1541, and a handsome bridge across the Moldava, and is the seat of a Greek Orthodox bishopric. Pop. est. 29,000. The area of the prov. is 810 sq. m., and its population approximately 130,000.

Roman Candle. Species of firework. The powder is contained in a cardboard tube. A continuous shower of sparks follows ignition, brilliant balls of fire being ejected at intervals. This type of firework was first made in Italy, hence its name. *See* Fireworks.

THE ROMAN CATHOLIC CHURCH

Canon W. F. Barry, author of *The Papal Monarchy*, etc.

This article is contributed by a distinguished Roman Catholic scholar. See the article Protestantism for the other side of the question. See also Christianity; Eucharist; Jesuits; Monasticism; the articles on the saints and fathers of the Church; also Papacy and biographies of the popes; and entries on Cope and other vestments

The compound term Roman Catholics is not admitted, save by accident or under protest, in documents emanating from the authorities of the institution thus described. The Vatican Council of 1870, in its decree *Dei Filius*, speaks of the "Holy Catholic Apostolic Roman Church"; and these words take us back to the Nicene Creed (325-379), beyond which the Apostles' Creed, of still higher antiquity, bears witness to primitive belief in the Catholic Church, as founded by Jesus Christ, and commissioned to teach all nations (*Matt. 28, vv. 19, 20*).

S. Irenaeus, bishop of Lyons, speaks of Rome as "the greatest church, the most ancient and conspicuous, founded and established by Peter and Paul"; he declares that "to this Church every Church, that is, the faithful from every side, must resort on account of the more powerful primacy." S. Cyprian, who pleaded with eloquence for the "unity of the Catholic Church," calls Rome "the see of Peter and the principal

Church, whence the unity of the priesthood took its rise."

S. Irenaeus and others give catalogues of the popes immediately following Peter to their own times. S. Silvester confirmed the Nicene decrees of 325; S. Celestine dictated those of Ephesus of 431; S. Leo the Great's "Tome," or dogmatic letter, was accepted by the six hundred bishops at Chalcedon, in 451, who acknowledged him to be "keeper of the vine," and "archbishop of the whole world."

None of the early heretics could persuade the popes to show them favour; while saints of the East, like Athanasius, Basil, John Chrysostom, and Cyril of Alexandria, made appeal to them in support of the Catholic creed. S. Jerome, by far the most learned among orthodox writers in the first six centuries, asks in controversy with Rufinus, "what does he call his faith? If he answers Roman, then we are Catholics"; and to Pope Damasus he writes, "I who follow none but Christ am in communion with thy Beatitude, that is to say,

with the See of Peter. On that rock, I know, the Church is built."

Pope Leo I claimed "Peter's privilege" for the see which he occupied. Nor does any historian doubt that, by the middle of the 4th century, all the essential features of the papal supremacy, both in ruling and teaching the universal Church, were manifest.

That which is now termed private judgement or free thought bore during the first period of Christendom the name of heresy. Orthodox Catholics would not suffer it, relying on S. Paul, who pronounced even an angel to be anathema, did he preach "another Gospel" (Galatians 1, v. 8); on S. John's command not to receive such a one (2 John, v. 10); on the saying of Christ, "If he will not hear the Church, let him be to thee as a heathen and a publican" (Matt. 18, v. 17). Hence the bishops, "the succession from the Apostles," defended the true revelation against its impugnors by insisting on tradition which they expounded according to "the rule of ecclesiastical and Catholic sense."

Disappearance of Sects

Heretics were cut off, excommunicated if they obstinately held to their doctrines; and those who set up bishops of their own in opposition to the recognized hierarchy, as the Donatists in Africa, were held guilty of schism, or sect-making.

The Church thus guided, in union with Rome, continued ever the same, *semper eadem*, in belief and observance, while Gnostics, Manichaeans, Arians, Nestorians, Monophysites rose, passed over the scene, and disappeared. But the sacrament of unity enabled the central Christian society to triumph over the sects, to survive the fall of the Western Empire, to convert the barbarians, and to save civilization. Papal Rome victoriously withstood the Muslim onset; by its Catholic enthusiasm Spain, after centuries of combat, won back freedom from the Moors, and planted religion in the vast American territories from Mexico to Paraguay.

We read in Gibbons's great work that the bishops made France, as bees make their hive. The crusades, inspired by popes, kept Saracens and Turks out of Europe, until the Greeks, quarrelling with Rome, lost Constantinople and enslaved themselves. In 1517, Luther opened the era of the Reformation, which led, wherever Rome's authority was denied, to national Churches, and then to sects beyond reckoning.

As computed, there may be almost four hundred millions all told who look to the bishop of Rome as their spiritual father. In every nation some are to be found. Of Churches calling themselves Christian, undoubtedly by far the largest is the Roman. Her votaries cover the whole of what was once the Western Empire, save that in Britain they are few; but Ireland, like Poland, must be added, with eight millions belonging to the various small uniate bodies in the Near East. Under the Stars and Stripes more than 29,000,000 dwell; Lower Canada is French Catholic; and nearly the whole of Central and South America belongs to the same communion. In the British Colonies and dominions 21 millions are reckoned altogether. Catholic missions flourish in Africa, especially in Portuguese, French, Belgian, and British territories. They have long been at home in India, China, and Polynesia.

This multitude of nations and peoples come under the jurisdiction of some 1,600 bishops, archbishops, and patriarchs, appointed by the pope; and is directed by a numerous clergy, the secular or diocesan, subject to local bishops, and others belonging to religious orders bound by special vows. Both diocesan and religious take upon them the lifelong obligation of celibacy. The orders of monks, friars, and various other denominations were founded by S. Benedict, S. Francis, S. Dominic, or follow the rule of S. Augustine, or are Jesuits from S. Ignatius of Loyola, to whose general method of life many more, springing up since 1600, have conformed.

Church Discipline

Orders of women, cloistered and contemplative, teaching and nursing, have grown rapidly, and are on the increase. Discipline is severe throughout the Church, and is often thought by strangers to be the secret of its power. But Catholics declare the secret to be a universal and utter belief in the supernatural treasures of which clergy and hierarchy hold the guardianship. The gift which the Church offers to the faithful is Christ Himself, not merely instruction or example, but the Holy Eucharist, absolution from sin, intercession at the altar, assistance by prayer and good works during life and after death.

All the elaborate machinery of government is only a means towards holy living and dying, of which the path and goal are set out in books, such as *The Imitation of*

Christ, *The Spiritual Exercises*, and countless others which might be quoted as illustrations of a striking fact, viz. that the most detailed Canon Law and unwearied episcopal vigilance lead us into a region where the spirit is all in all. Saints and their wonderful works are the ever-present aim of Catholic teaching; there is no age but yields a harvest; and the pope who canonises them calls himself "servant of the servants of God."

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Romance (Old Fr. *romanz*, from late Lat. *romanicē*, in the vulgar tongue). Primarily signifying a work in one of the Romance dialects derived from the Latin language, especially early French and Provençal, the word romance soon came to denote specifically the chronicle of adventure, narrated in verse or prose, to which this vernacular literature was mainly devoted. Of fiction of this kind, epic in its essence, the *Odyssey* of Homer was the prototype, and its natural development was the picaresque romance exemplified in the literatures of Spain, France, and England by Don Quixote, Gil Blas, and Tom Jones. Occupying a place between the medieval legendary romance, concerned chiefly with action, and the modern novel, concerned chiefly with the dramatic presentation of ideas, romance makes use of properties of both the one and the other; and, in addition, has qualities peculiar to itself that not only invest its literary expression with glamour so distinctive as to constitute a separate art form, but also create an atmosphere in which the facts of common life appear glorified.

The evolution of romance as an art form can be studied in this Encyclopedia in the articles on the literatures of the various countries in which it was brought to high perfection, and in those on the great writers who were its best

exponents. *See* Novel; Romanticism; Romantic Movement; Troubadour.

Romance Languages. Name given to a group of languages, including a number of dialects, spoken in most of those countries of S. and W. Europe which once belonged to the Roman empire. These languages are: Italian, Spanish, Portuguese, Provençal (with Catalan), Rhaeto-Romantic (spoken in the Grisons and Tirol), Rumanian, and French. They are all descended from Latin, not the literary, but the popular language—vulgar Latin or *lingua Romana*.

The Romance languages, as contrasted with their parent, are strikingly analytic. There are hardly any traces of noun-inflexion which is abandoned in favour of prepositions; auxiliaries are much used in representing verbal inflexions; a definite and an indefinite article have been added. On the other hand, the Romance languages exhibit greater wealth of new formations, such as augmentatives and diminutives. The vocabulary is in the main Latin, consisting partly of words handed down from generation to generation, partly of words of more recent origin, derived from literary, ecclesiastical, and legal sources. Several other languages have also contributed. There are numerous Celtic elements in French. German has supplied many terms, especially in connexion with military and judicial matters, hunting, navigation, and articles of dress. Spanish and Portuguese show considerable traces of Arabic influence. But the most mixed is Rumanian, into which Slavonic, Turkish, Greek, and Illyrico-Albanian elements have made their way. Italian has remained most faithful to the parent language, while French exhibits the greatest divergences. *See* France; Latin Language; Provence; Spain, etc.

Roman de la Rose (Fr., romance of the rose). Allegoric, descriptive, and philosophic old French poem. The first part, about one-fifth, was written c. 1225 by Guillaume de Lorris, and the rest was added about 1270 by Jean de Meung or Clopinel. Two hundred MS. copies have survived. Lorris wrote of the lover, or love personified, in search of the rose typifying beauty. The continuator ranges over all fields of knowledge and speculation, and in doing so throws much light on the life and thought of the 13th century. The Romance of the Rose had great influence in Italy and England, as well as in

France. Chaucer translated nearly one-third of its 22,000 lines. In the 16th century Marot rewrote the whole poem in the French of his day; and during 1878–80 a fresh translation into modern French was published. *Consult* English version by F. S. Ellis, 1900.

Romanes, GEORGE JOHN (1848–94). British scientist. Born at Kingston, Canada, where his father was a professor, May 20, 1848, he was taken at an early age to England, where he completed his education at Caius College, Cambridge.



George J. Romanes,
British scientist

Deciding to make scientific research his life-work, he made many biological observations in a laboratory of his own, at Dunskaith, in Scotland. The results of his work appeared in various papers and lectures, and won for him the F.R.S.

In early days Romanes had thoughts of becoming a clergyman, but for a time he took up an unorthodox attitude, and his *Candid Examination of Theism*, 1878, was antagonistic to accepted beliefs. Later on, he returned to something of his old faith, and revealed this in *The Fallacy of Materialism* and some other writings, e.g. *Thoughts of Religion*, published in 1895. He died in Oxford, May 23, 1894. His works include *Animal Intelligence*, 1881; *Mental Evolution in Animals*, 1883; *Darwin and after Darwin*, 1892–97; and *Essays*, 1897. *Consult* his *Life and Letters*, by his wife, 1896. *Pron.* Romanes.

Romanes Lecture. Annual lecture delivered at Oxford. It was founded by George John Romanes in 1891, the terms being that a man of eminence shall be elected annually to deliver a lecture on a scientific or literary topic. Gladstone delivered the first, on *Medieval Universities*, Oct. 24, 1892; and later lecturers have included T. H. Huxley, W. Holman Hunt, T. Roosevelt, Lord Oxford and Asquith, John Masefield, Winston Churchill, and Julian Huxley.

Romanesque Architecture. In general, the style of building prevalent in Europe from the 4th century to the 12th. Based on Roman architecture, it expressed and developed the principle of the round arch and the vault, but locally it differed widely from its exemplar in plan and constructive

aim. Thus the Romanesque period witnessed the development of the cruciform church, henceforward the standard type of medieval church, from the old basilica. With the exception, too, of certain structures in Germany and N. Italy, where the Teutonic builders clung to the old Roman weight and massiveness of masonry up to the 12th century, Romanesque construction was comparatively light.

Broadly speaking the style followed two separate lines of development, those of the East and the West. That of the East, radiating from Constantinople, was known as the Byzantine, and had for its special mission the perfection of the dome. That of the West was profoundly modified by Byzantinism, especially in Venice, Ravenna, and along the Adriatic shore, and shared with it certain distinctive features, such as the springing of the arch direct from the cushion capital. The progress of Romanesque towards Gothic was more rapid in France than elsewhere; there, builders were the earliest to attack the structural problems, were the great experimenters in the lightening of construction, and invented the flying buttress and, ultimately, the pointed arch.

Among the principal features of a decorative character in Romanesque building was the arcade. In the Rhenish towns and throughout N. Italy, arcades are present in vast numbers, sometimes about the size of churches or cloisters, elsewhere as mere ornament on a blank wall. Every variety of colonnette was used, with or without constructional value; capitals and string courses were richly carved, the carving being more naturalistic in the N. than in the S., where the classic forms still prevailed. Domed roofs were covered with mosaics; pavements richly inlaid, especially in buildings erected under Byzantine influence. In England, Romanesque appeared in the 11th century in the form of Norman architecture (*q.v.*). It flourished also with local peculiarities in Provence, where, in the 11th and 12th centuries, it is spoken of as the Roman style. *See* Apse; Arcade; Architecture; Basilica; Byzantine Architecture; Capital; Mosaic; Rome; Art.

Romani. Town of Egypt, in the N. of the Sinai peninsula. It is 20 m. E. of the Suez Canal, on the rly. from El Kantara along the Mediterranean coast. It gives its name to a battle fought in Aug., 1916, between the British and the Turks,

and sometimes called the second battle of Katia, after the retirement of the Turks from Katia in April. At Romani the British had constructed permanent defensive works. At midnight of Aug. 2-3, the Turks attacked the British positions from Romani to Mahemdia on the sea, and at the same time attempted from the S. to cut in rear the British communications by an advance across the high sand dunes.

Fighting continued during Aug. 5-7, the British steadily resisting the Turks, and later throwing them back. The Turks retreated upon El Arish (*q.v.*). Turkish losses were estimated at 10,000, of whom 5,000 were prisoners.

Romania. Name given sometimes to the Latin kingdom of Constantinople, which was founded by the Crusaders in 1204 and lasted until 1261. In 1203 the fourth crusade reached Constantinople, and restored Isaac Angelus and his son, Alexius IV, to the throne of Byzantium. Troubles then arose between the allies, the result being that the Crusaders assaulted, captured, and plundered the city. Then the new empire was founded, its first ruler being Baldwin, count of Flanders. It was organized on feudal principles, but the emperor's authority was practically confined to the neighbourhood of Constantinople and some islands in the Aegean.

Baldwin was taken prisoner in Greece, and his successors could do nothing to maintain, much less to extend, their authority. Their vassals were occupied with their own affairs, and the Byzantine emperors, who had retired to Asia Minor, won back their lost territory piecemeal until in 1261 Michael Palaeologus retook Constantinople. The Latin empire thus came to an end, although the last emperor, Baldwin II, was occupied until his death in 1273 in planning its recovery. See Byzantine Empire; Crusades.

Roman Law. System of civil law evolved in the Roman state from the time of the kings until its codification by Justinian. Its importance lies in the fact that it is still the basis of a large part of European jurisprudence, as well as of the systems in other parts of the world, such as S. America and S. Africa, which were built up originally on the same basis. Further, it lays down many principles which are common to the English law, and under the latter system are actually expressed in the original Latin, *e.g.* *Volenti non fit injuria*,

a person cannot be injured by what he willingly consents to; *ignorantia juris neminem excusat*, ignorance of the law excuses no one; *res ipsa loquitur*, the thing speaks for itself. Moreover, it is unique in history as a steady developing system of law whose course can be traced for some 1,300 years, and which early freed itself from the somewhat superstitious and religious rites and rules.

Taking the Twelve Tables (450 B.C.) as the starting point, the sources of Roman law may be summarised as follows: (1) Imperial decisions, whether made in the form of commands to officers (*Mandata*), replies to appeals from public bodies (*Epistolae*), or from magistrates (*Rescripta*), or of judgements (*Decreta*), or of general laws (*Edicta*). (2) Equity of the praetors and curule aediles. (3) Opinions of the jurisconsults (*Responsa prudentium*), of whom the greatest were Paulus, Ulpian, Papinian, Gaius, and Modestinus. The best part of Roman law may be ascribed to the jurisconsults, though the praetors also built up a sort of case-law, useful and effective till codified by the *Edictum Perpetuum* of Salvius Julianus in the reign of Hadrian (A.D. 117-138). In 529-30 came the Institutes and Pandects of Justinian.

Freeing of Slaves

In early Roman society slavery was the general state of the masses, but slaves could be, and often were, freed in various formal ways, such as *manumissio*. In all classes *patria potestas* was the rule; the father, speaking generally, had absolute power over his wife and children, and was legal owner of all property in their possession. But, by a fictitious process of pawning his son, *mancipatio*, a father could free him from the parental power. A man could not sell any real property which formed part of his wife's dowry.

Owing to the strict laws of succession, depending upon the ancient idea of ancestral piety, it was essential in early Roman law to have an heir who was bound to undertake all the funeral rites and pay the deceased's debts, even if the latter left no estate. So if there were no son one was adopted to carry on the succession. Finally, in Justinian's time, something like the modern methods of distribution of a dead person's assets was adopted, and due regard was paid to the claims of the blood. Even then the dominant idea of a will or *testamentum* was the naming of an heir, but this was superseded

eventually by *codicilli* and *fidei-commissa*, whereby the testator's wishes for the disposal of his property could be executed with less formality. Children of a deceased person were entitled to one-fourth of his property, and he could not will it away. If there were four children or fewer, their share was $\frac{1}{4}$, if five children or more, $\frac{1}{5}$. A poor widow was allowed $\frac{1}{2}$ if without a dowry, and if she had three children she took a *virilis pars*. This bar against complete disinheritance still holds in legal systems based on the Roman law. See Jurisprudence; Justinian; Law; Scots Law; Slavery; Twelve Tables; Will.

William Latey

Romano, GIULIO (c. 1492-1546). Italian painter, whose real name was Giulio Pippi dei Giannuzzi.



Giulio Romano,
Italian painter
Self-portrait

Born in Rome, he studied under Raphael, who employed him at the Vatican. After Raphael's death, the completion of his frescoes in the Hall of Constantine in the Vatican

was entrusted to Giulio and G. Penni. In 1524 Giulio entered the service of Federigo Gonzaga at Mantua, where he acted as architect and decorator of the Palazzo del Te. He died at Mantua, Nov. 1, 1546. See Ceiling.

Romanones, ALVARO FIOQUEROA Y DE TORRES MENDEIYA DE ROMO, COUNT OF (b. 1863). Spanish statesman. He was born at Madrid, Aug. 1, 1863, and entered the cortes as Liberal deputy for Guadalajara, first holding office in 1905, when he was minister for public works, agriculture, and commerce. He was prime minister during successive Liberal governments, 1912-13, 1915-17, and 1918-19. Foreign minister in the last cabinet under the monarchy, 1931, he was an opponent of Primo de Rivera (*q.v.*). He wrote *The Republic in Spain*, 1932.

Romanov. Name of the family which occupied the throne of Russia, 1613-1917. It derives its name from Roman, a member of an old noble house, whose daughter, Anastasia, married the tsar Ivan the Terrible, while his son, Nikita, married the princess Eudoxia, a descendant of Rurik, the founder of the Russian monarchy. Nikita's son, Feodor, became the patriarch Philaret of Moscow, and his son,

Michael Romanov, was elected tsar in 1613. He was succeeded by his son Alexis, and then by his grandsons, one of whom was Peter the Great. The male line ended with Peter II in 1730, when Anna, daughter of Ivan II, ascended the throne.

On the extinction of her line, at the death of the empress Elizabeth in 1762, the crown passed to the Holstein-Gottorp or Oldenburg branch. This was descended from Anna, daughter of Peter the Great, and her husband, Charles Frederick, duke of Holstein-Gottorp. Its first sovereign was Peter III, and the family occupied the throne until the abdication of Nicholas II, March 15, 1917. *See* Moscow; Russia. *Consult* The Real Romanovs, G. Botkin, 1932.

Roman Remains in Britain.

From the deposit left by four centuries of occupation and building in the islands, it is easy to deduce in detail the Roman way of life in Britain. Foremost among these antiquities are the Roman roads (*v.i.*), the lines of which are still followed by modern highways. There are walls, gateways, and other examples of brickwork in most cities whose names end in *caster*, *chester*, or some similar form; complete towns have been excavated at smaller places like Silchester and Caerwent; villas like those at Bignor and Chedworth are widely scattered. Roman weapons, tools, playthings, and artistic objects are constantly coming to light; even in the Second Great War a Home Guard in Hampshire gave information which led to the unearthing of one of the richest finds of Roman pottery. *See* Air Photography; Antonine's Wall; Baths; Ermine Street; Hadrian's Wall; Roman Wall; Verulamium; Watling Street.

Roman Road. Highway constructed by the Romans. They were great builders of roads and those they made possess remarkable powers of endurance. They also developed existing roads. In England many roads radiated from London. The chief were Watling Street and Ermine Street; while three others were Akeman Street, Icknield Way, and Fosse Way. *See* Britain; Roads; Watling Street, etc.; *consult also* Roman Roads in Early Britain, T. Codrington, 1905.

Romans. Town of France, in the dept. of Drôme. It stands on the right bank of the Isère, 49 m. W. of Grenoble. A bridge connects it with Bourg-de-Péage

opposite. It has manufactures of leather, shoes, gloves, baskets, hats, etc., and there is a considerable trade in cloth, liqueurs, and cattle. The mulberry is cultivated, and in the vicinity is the famous vineyard of l'Ermitage. The town grew up round an abbey founded by S. Bernard of Vienne, in 837. The church of S. Bernard lost some valuable ancient stained glass by air raids during the Second Great War. Pop. est. 17,000.

Romans, Epistle to the. One of the four principal Epistles of S. Paul. It would seem to have been written from Corinth towards the end of the Apostle's third missionary journey, and to have been intended to prepare the way for a visit to the Roman Christians, which he was hoping soon to make. Its purpose is to explain the universal character of the Gospel, and the leading ideas of Christian doctrine, and to give practical advice.

S. Paul declares that Jew and Gentile alike are assured the righteousness of God by faith (justification by faith). What then becomes of the law? The answer is that, since Abraham himself was justified by faith apart from the law, justification by faith implies freedom and redemption from the law. The Apostle himself was set free by Christ from the law of sin and death (Rom. 7, v. 13-25; cf. 1 Cor. 15, v. 22). If God rejected the Jews in order to save the Gentiles, the responsibility was their own; and it was still possible for them to be restored to favour (chaps. 9-11). In the practical exhortation the Romans are urged to love the brethren, to submit to the powers that be, to avoid judging one another harshly, and to bear the infirmities of the weak (chaps. 12-15).

The epistle was written about A.D. 58 to a community which included both Jews and Gentiles. Its genuineness is fully attested. It is included in the Canon of Marcion and in the Muratorian Canon. It was used freely by the author of 1 Peter, and by Clement of Rome, Ignatius, and Polycarp. It has much in common with other epistles written by S. Paul. It should be added that there is manuscript authority for the omission of the words "in Rome" in 1, vv. 7, 15; and in some manuscripts the doxology of 16, vv. 25-27 (A.V.) is found at the end of 14, or in both places, or is not found at all. Possibly there were in circulation abbreviated copies of the

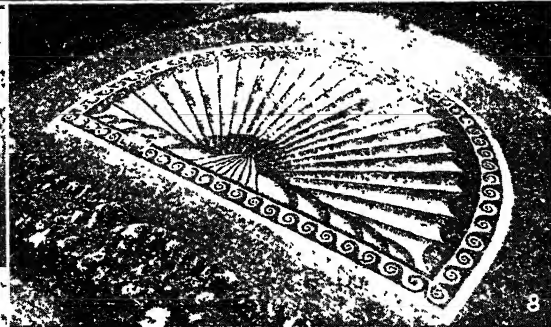
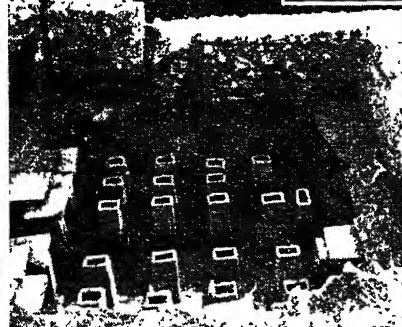
epistle. *See* Bible; Paul. *Consult also* Romans, H. C. G. Moule, 1907; Epistle to the Romans, E. F. Scott, 1947.

Romansch. A language of Switzerland. It is an offshoot of Latin, and, by a decree of the Swiss federal council, passed on July 8, 1937, became an officially accepted language of the country, jointly with French, German, and Italian, except in parliament. The language's great protagonist in recent times was Eider Lausel, Romansch poet, a native of the Lower Engadine. The language is spoken by some 50,000 people in the Engadine, the Oberhalbstein, and the Grison's Oberland.

Romanticism. Movement in art. Embodying a revolt against the classic tradition in art, it began about the middle of the 18th century, and permeated all Western Europe. It constituted an appeal to the emotions instead of to the intellect, and reached its climax of intensity in the first part of the 19th century, affecting the modes of the day, when materialism in the industrial world had become all-powerful. Its principal manifestations were the school of figure painters headed by Géricault and Delacroix, and that of the Barbizon painters of landscape, while the same ideal was taken up by the English Pre-Raphaelites. There were counterparts of art romanticism in Germany, particularly at Düsseldorf under Schadow's leadership, and also in the Antwerp school of historical painters.

Romantic Movement. Name given to a phase through which imaginative fiction in prose and verse passed in the period approximately covered by the last third of the 18th and the first third of the 19th century. It was to some extent a literary version of romanticism in painting. A reflection in literature of the universal effort at emancipation from tyranny that culminated in the French Revolution, with its later repercussion throughout Europe, it was largely a rebellion against the inflexible rigidity and limited imaginative range of the classical school which had dominated all European literature for over a century.

In Great Britain the movement is dated as beginning with Percy's *Reliques of Ancient Poetry*, 1765, and the literary forgeries of Macpherson and Chatterton. The native wealth of romantic material thus discovered gave literary genius a new interest in medievalism. In The Castle of Otranto,



1. Road through the Forest of Dean, Glos. marked by large stones characteristic of Roman paving. 2. Steps and garden at Chedworth villa near Cirencester. 3. Helmet found near Guisborough, Yorks. 4. Sculpture found in the bed of the river Walbrook

which once flowed across London. 5. Bust of Hadrian recovered from the Thames. 6. 4th cent. bastion of the Legionary camp at York. 7. Central heating system under the floors of a villa at Darent, Kent. 8. 2nd cent. mosaic at Verulamium near St. Albans

ROMAN REMAINS IN BRITAIN: RELICS OF THE INVADERS OF 2,000 YEARS AGO

Photos, 1, B C Clayton, 2, Humphrey Joel, 7, B C Youens, 8, Photo Work, Ltd, Brighouse

1764, Horace Walpole deliberately made the experiment of blending ancient romance with the modern, grafting the supernatural element of the former on to the realistic truth to life of the latter. His book, with all its faults, obvious even at that time, fixes his place as the inaugurator of the romantic movement that in England passed through Anne Radcliffe, "Monk" Lewis, and others, to find its full perfection in the romances of Scott and the poetry of Byron, Shelley, and Keats.

In Germany the romantic movement may be traced through Goethe (in his first phase), Schiller, Bürger, and the Schlegels; in France through Rousseau, Chateaubriand, the elder Dumas, Victor Hugo, whose *Hernani*, 1830, marks a climax, Béranger, and de Musset; in Italy, where it never established itself securely, in Manzoni and Leopardi. See Goethe; Romance; Rousseau, etc.

Bibliography. *Histoire du Romantisme*, T. Gautier, 2nd ed. 1874; *Main Currents in 19th Century Literature*, 6 vols., G. Brandes, Eng. trans. 1901-05; *English Romantic Movement in the 18th Century*, W. D. MacClintock, 1903; *The Romantic Revolt*, C. E. Vaughan, 1907.

Romantic Music. A term applied to that class of composition which early in the 19th century began to supersede the so-called classical school, as a result of a desire to make music expressive of emotion and imagination rather than merely correct on formal lines. Even in classical times, however, the spirit of romanticism was often present. The later works of Beethoven showed the way to Schubert, Chopin, Schumann, Mendelssohn; and Berlioz, Liszt, and Wagner carried the movement further.

Roman Type. Principal style of type used for book, magazine, and newspaper printing, as distinct from italic, gothic, black letter, and other decorative types. It was the style of lettering used on Roman inscriptions, which replaced the older Greek letters.

Roman Wall. Term used in the U.K. to denote in particular Antonine's Wall and Hadrian's Wall (*q.v.*). Remains of other walls built by the Romans mark their forts at Aesica, Castle Cary, Ribchester, etc., and their towns at Silchester, Viroconium, Caerwent (the ancient Silurum), Chester, (the ancient Deva), and London (see London Wall). They were developed from earthwork

campes laid out by Agricola and his successors. See Britain.

Romany Rye, THE (The Gypsy Gentleman). Autobiographical romance by George Borrow, first published in two volumes in 1857. A sequel to *Lavengro* (*q.v.*), and written at Oulton Broad, it recalls some of the author's early experiences of gypsy life in England, and is one of the most popular of his works. The title is taken from a song sung by Petulengro in chap. 54 of *Lavengro*.

Romberg, SIGMUND (b. 1887). Hungarian-born American composer. Born at Szegedin, July 29, 1887, and educated at Bukarest university, he became a prolific

composer of operetta, musical comedy, and revue. His most tuneful scores were for *The Student Prince*, 1924; *The Desert Song*, 1926; *The New Moon*, 1927, all popular in London and New York. Romberg scored an outstanding Broadway success with *Up in Central Park*, 1945.

Rome. Prov. of Italy, in Latium. Lying S. of Viterbo and N. of Littoria, its area is 4,664 sq. m. Backed by the Apennines, it is largely mountainous. The Tiber flows through it, and it contains Bracciano, Albano, and other lakes. Although it includes the city of Rome, it is mainly an agricultural area.

ROME: THE CITY AND ITS HISTORY

Thomas Ashby, D.Litt., Director, British School at Rome, 1906-25

This article deals with the city of Rome, the empire which developed therefrom being the subject of the succeeding article, while a further contribution deals with Roman art. See also the entries Capitol; Forum; Palatine; Vatican; Viminal, and others associated with the city; also Ostia; Romulus, etc.

A city of Italy, capital of the republic as it was of the monarchy, Rome stands on the Tiber, mainly on the left bank, 17 m. from its mouth. Pop. (1947) 1,551,520.

The traditional date of the foundation of Rome is 753 B.C., and recent discoveries have shown that

this is approximately correct. The nucleus of the city was the Palatine hill, no doubt selected by the first settlers, whoever they were, owing to its natural



Rome. Arms of the city

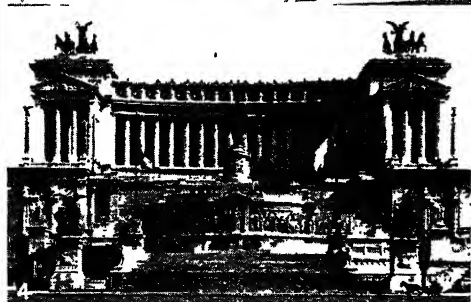
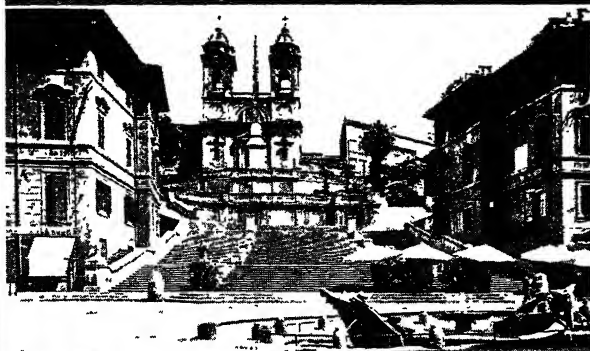
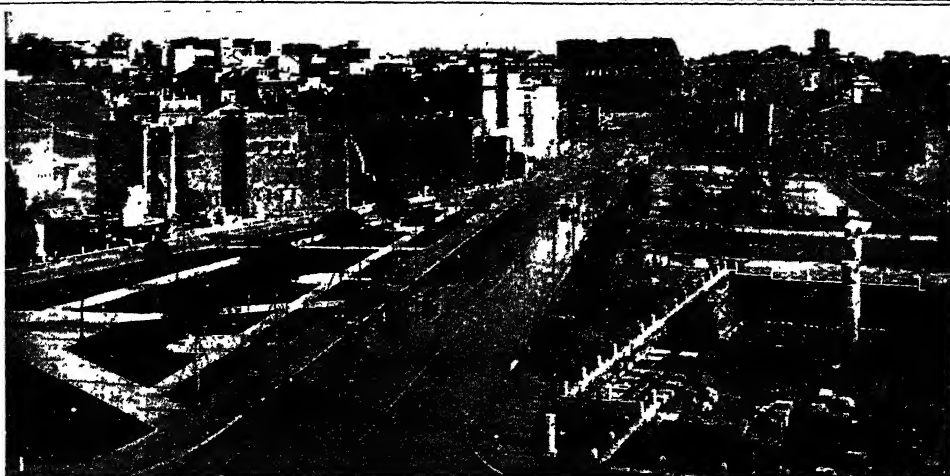
advantages of strength and position. There were other settlements on the surrounding hills, of less importance, and these were fused into one about the middle of the 6th century B.C., when the Cloaca Maxima was constructed, and the adoption of the Forum as a market place made possible.

To this period belong the earliest city walls, attributed to Servius Tullius, which were reconstructed after the capture of Rome by the Gauls in 390 B.C.; they enclosed the seven hills of Rome—Palatine, Capitol, Aventine, Caelian, Esquiline, Viminal, and Quirinal. They consisted of a massive embankment wall, built on the edge of the cliffs (which were far more prominent in ancient times than now, when it is often difficult to recognize them), or protected by a ditch where it was necessary to cross level ground.

An outpost on the right bank, on the summit of the Janiculum, protected the crossing of the river by the Pons Sublicius, the earliest of Roman bridges, built entirely of wood. The area which these walls enclosed was larger than was actually occupied by buildings, and the growth of the city was naturally at first most rapid in the low ground, where water could be obtained from wells, and where the Tiber, an important waterway even in early times, was most easily accessible. Its main lines were dictated by the natural features and by the position of the city gates, from which issued the famous roads which, at first leading only to the villages in the neighbourhood, were gradually extended all over the Roman empire.

The first military highway, the Via Appia, was constructed in 312 B.C., and the first aqueduct dates from the same period. Others followed as occasion demanded, and the provision of a good water supply—and no city in the world had or has a better—rendered it possible for Rome to extend over the hills. The city grew up, however, quite unsystematically; the area by the river was cramped, although it had already overflowed into the Campus Martius, the low ground on the north by the river, which was originally the drill ground and had been left outside the walls of the city.

Julius Caesar was the first to devote particular attention to this problem. He remodelled the

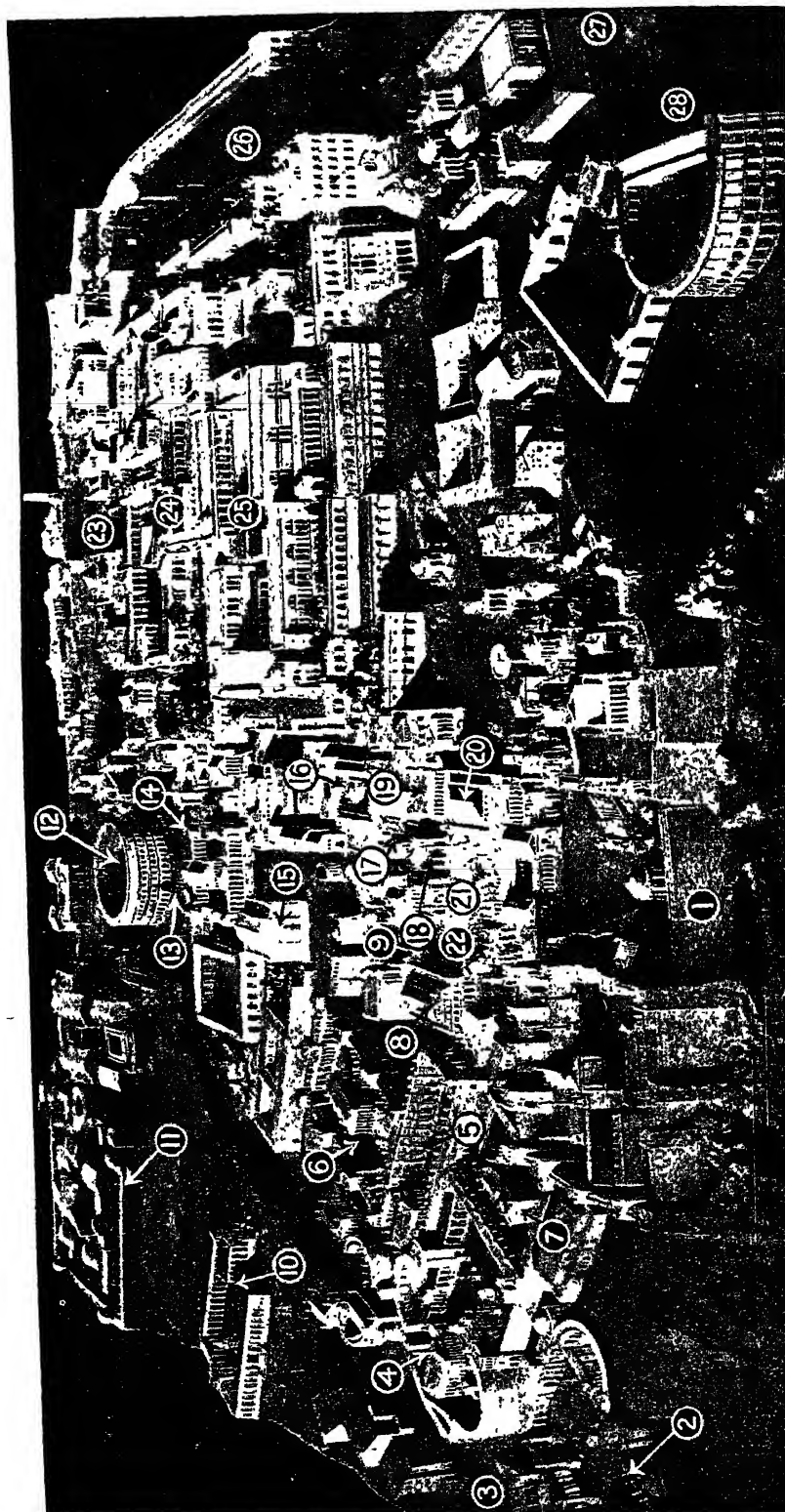


1. The Via dell'Impero, a road constructed by Mussolini, leading to the Colosseum. 2. Piazza di Spagna. 3. The Ponte Fabricio built in 192 B.C., the oldest bridge over the Tiber. Beyond is the Church of San Bartolomeo and a medieval watch-tower. 4. The

National Monument to Victor Emmanuel II. 5. Quirinal Palace, founded by Gregory XIII in 1574. 6. Flats in the St. Lorenzo ward, built after the Second Great War, one block was reserved for war victims. 7. Crescent of shops in the Trajan's forum

ANCIENT AND MODERN ROME: VIEWS IN THE IMPERIAL CITY

Photos, 2, 5, Enrico Vellesi, 3, Donald McLeish



1. Capitoline Hill with its temples and many public buildings. 2. Basilica Ulpia. 3. Forum of Trajan, erected A.D. 111-114. 4. Forum of Augustus, built after the battle of Philippi, 42 B.C. 5. Forum of Nerva. 6. Forum of Vespasian and Temple of Minerva. 7. Temple of Venus. 8. Basilica Aemilia, built by Aemilius Lepidus, 179 B.C. 9. Temple of Antoninus and Faustina, dedicated A.D. 141. 10. Portico of Livia. 11. Baths of Trajan. 12. Colosseum. 13. Colossal statue of Nero as god of the sun, 118 ft. high. 14. Temple of Titus and Trajan. 15. Basilica of Constantine, originally built by Constantine, 312-35 A.D. 16. Theatre of Marcellus, completed 13 B.C., accommodating about 14,000 spectators. 17. House of the Vestals. 18. Triumphal arch of Augustus. 19. Temple of Vesta. 20. Basilica of Castor and Pollux, built by Julius Caesar, 6 B.C. 21. Rostra, or platform from which the public orators made speeches, erected by Augustus. Nos. 14 to 21 were included in the Great Forum. 22. Arch of Septimius Severus, erected A.D. 203 to commemorate the emperor's eastern victories. 23-25. Imperial palaces on the Palatine Hill. 26. Circus Maximus, which held over 200,000 spectators. 27. The Velabrum quarter. 28. Theatre of Marcellus.

ROME: RECONSTRUCTION OF THE SOUTHERN AND MOST IMPORTANT PORTION OF THE ANCIENT CITY

From the reconstruction in plaster by Prof. Mercatelli

Forum Romanum—what we now see there is in the main his in conception—and built the first of a series of fora in the space between the Capitol and Quirinal, with a view to the improvement of communications between the N. and S. parts of the city. It was in his time, too, that the river was first embanked, and that Pompey erected the first important group of public buildings in the Campus Martius.

Augustus completed what Julius had begun, and besides displayed much activity in other directions; so that his famous boast that he found Rome of brick and left it of marble is amply justified. He erected three groups of public buildings in the Campus Martius, restored no fewer than 82 temples and built others, including that of Apollo on the Palatine, divided the city into 14 regions, eight of them within the Servian wall and five outside it, the fourteenth being formed by the island and a considerable commercial quarter on the right bank of the river. A police and fire brigade was also established, the river was once more regulated, and the first public baths were constructed.

Imperial Palaces

The next emperors were mainly occupied with providing themselves with magnificent palaces. Augustus had been content with the house of Cicero's opponent Hortensius, which, generally known as the house of Livia, may still be seen on the Palatine. This was the aristocratic quarter, and recent excavations there have brought to light remains of other houses of the same period with fine paintings. The successors of Augustus constructed a splendid palace on this hill, while Nero occupied the whole district between the Palatine and Esquiline with his enormous Golden House, which spread over a larger area than the Vatican. Whether he was responsible for the fire which is always associated with his name will never be known; but he certainly took advantage of it, not only in this respect, but by compelling private proprietors to reconstruct their houses more substantially and to encroach less on the streets.

Vespasian marked the accession of a new dynasty by the restoration to public uses of much of what Nero had appropriated, and built the first permanent amphitheatre, the Colosseum, where Nero had formed an ornamental lake; he also added a new forum, that of Peace, rebuilt the temple of Jupiter on the Capitol, and carried out a new survey of the city. To his second son, Domitian, is mainly due the construction of a still more

magnificent imperial residence on the Palatine. Of that which had preceded it, we may gain some idea from the remains which he left under the floors of his palace, for Roman builders did not destroy the remains of previous edifices, but left them to serve as foundations. It was approached from the Forum by a series of magnificent halls, one of which has been wrongly identified with the temple erected in honour of Augustus after his death, while the church of S. Maria Antiqua was ensconced in another in the 6th century.

Thence an inclined plane led up to the Palatine, where the palace of Tiberius on the N.W. summit of the hill was rebuilt, while the S.E. part was taken up by another huge palace, divided into state apartments, a residential portion, and a garden. Domitian began the construction of a new forum, which was finished by Nerva; but the series of imperial fora was completed by Trajan, who finally cut back the cliff of the Quirinal to a maximum height of 100 ft., as the inscription on his column records, and overcame the difficulty of communications through this narrow space—a modern problem also until Mussolini built the Via dell' Impero. Trajan also brought another aqueduct to Rome, and erected enormous public baths on the site of the Golden House. These were until 1895 known as the baths of Titus, which were in reality close to the Colosseum, and very much smaller.

The Golden Age

Hadrian, his successor, was also active in building, and besides the immense villa which he erected for himself near Tivoli he is responsible for the temple of Venus and Rome, for the Pantheon in its present form, one of the best preserved ancient buildings, and certainly the most beautiful interior which we have, and for his mausoleum, which later became the Castle of S. Angelo, the great fortress of the popes, and the bridge leading to it. Marcus Aurelius imitated Trajan in erecting a column on which his campaigns were represented in bas-relief; but Septimius Severus was the next great builder, the fire in the reign of Commodus having given him his opportunity.

The temple of Vesta, the house of the Vestals, and other buildings were restored by him; he made a considerable addition to the imperial palace on the Palatine, and was responsible for a marble plan of ancient Rome, considerable fragments of which exist. His son

Caracalla built huge thermae on the Via Appia, but the rest of the emperors of the 3rd century A.D. had no leisure for building, with the exception of the hasty construction of the city walls by Aurelian and Probus, who took advantage as far as possible of existing buildings. They are built of concrete faced with brick and are still in great measure preserved.

In 283 another fire gave Diocletian the opportunity of further extensive restorations; he was also responsible for the colossal baths which bear his name, and which are now the seat of one of the finest of Roman museums. Maxentius erected the greater part of the huge basilica in the Forum which his conqueror, Constantine, completed—a building which can no longer claim to be the earliest basilica in Rome, now that one of the 1st century A.D., undoubtedly pagan, decorated with very fine stuccoes, has been found underground near the Porta Maggiore.

Christian Basilicas

Constantine was also responsible for the erection of the earliest and most important of the Christian basilicas: S. Pietro, S. Paolo, S. Lorenzo, etc., many of which stood on the actual site of the tombs of the martyrs; this fact led to the preservation of the roads which led to them throughout the Middle Ages, and is thus of topographical importance. After the triumph of Christianity the catacombs, which had been excavated along the main highroads, became the goal of pilgrims, and some of the basilicas of Constantine were built over the tombs of the saints.

After the barbarian invasions, in which the aqueducts were destroyed, the upper portions of the city, which depended on them for their water supply, were abandoned, and medieval Rome, with the exception of a number of isolated churches, convents, and strongholds, was crowded into the low ground near the river. Many of the last were built into the remains of ancient edifices, which had been partially ruined by earthquakes; one of the worst of these occurred in the middle of the 9th century. It is to these, and not to the damage wrought by the barbarian invaders, that the destruction of the ancient monuments must be attributed.

Of medieval Rome, as a fact, very little remains except towers and campanili. Most of the churches, as well as the great papal palaces of the Vatican and the Lateran, have been transformed entirely by the architects of the Renaissance and of its successor

the baroque period. And the popes, no less than the emperors, sacrificed the work of both their pagan and Christian predecessors to their own, which was in most cases of great merit, though less can be said in favour of the decay in taste of the 18th and the neo-classicism of the 19th centuries.

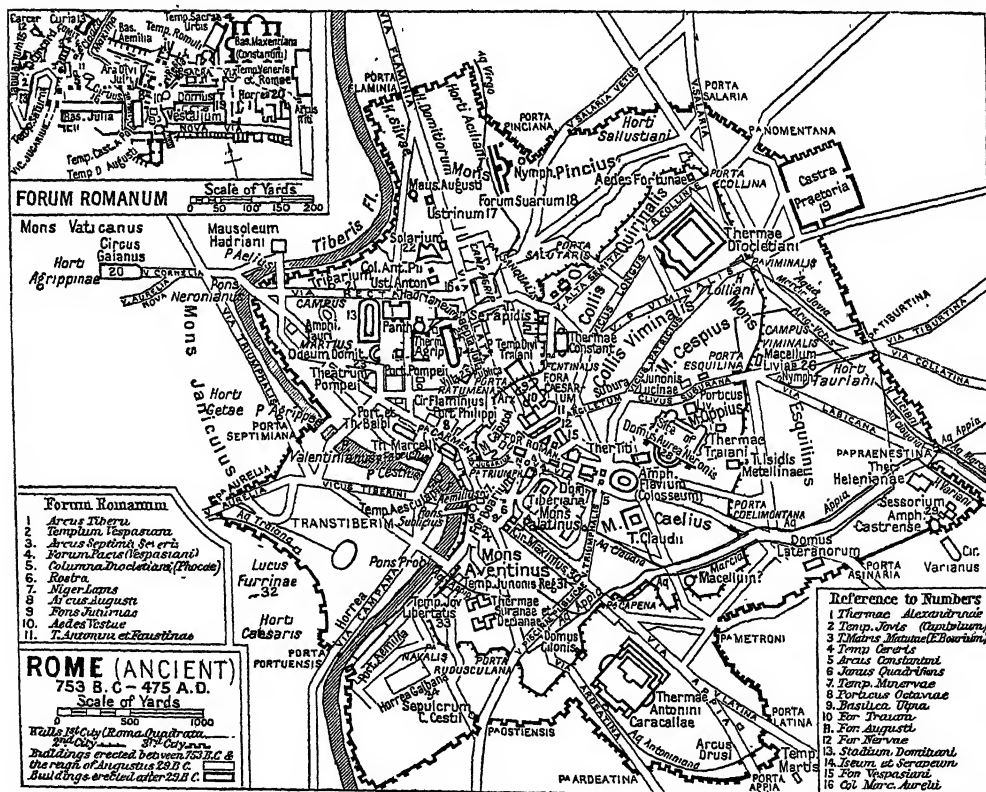
From the 15th century onwards we have a series of plans, bird's-eye views, and views of the city which surpasses in completeness anything else of the kind. From these we learn that it was in the pontificate of Sixtus V (1585-90) that Rome took on the outward appearance which it had until after 1870. By the construction of an aqueduct which supplied the hills, he rendered them once more fit for habitation, and the transformations which he wrought in the

streets are noteworthy. The reerection of many ancient obelisks did much to give them a striking termination. After 1870, the growth of the modern city led not only to the occupation of almost all the areas within the city walls by buildings, but to the construction of numerous suburbs, which are now regulated in accordance with a plan drawn up by the municipality.

The fundamental error, however, which was made in the first few years of Rome's life as the capital of Italy, can never be wholly corrected; and, indeed, its consequences must always be felt. Owing to the fact that the new quarters were allowed to spring up on all sides of the old city, it has been necessary, and will always be so, to cut new thoroughfares through the centre of it, and the compromise between

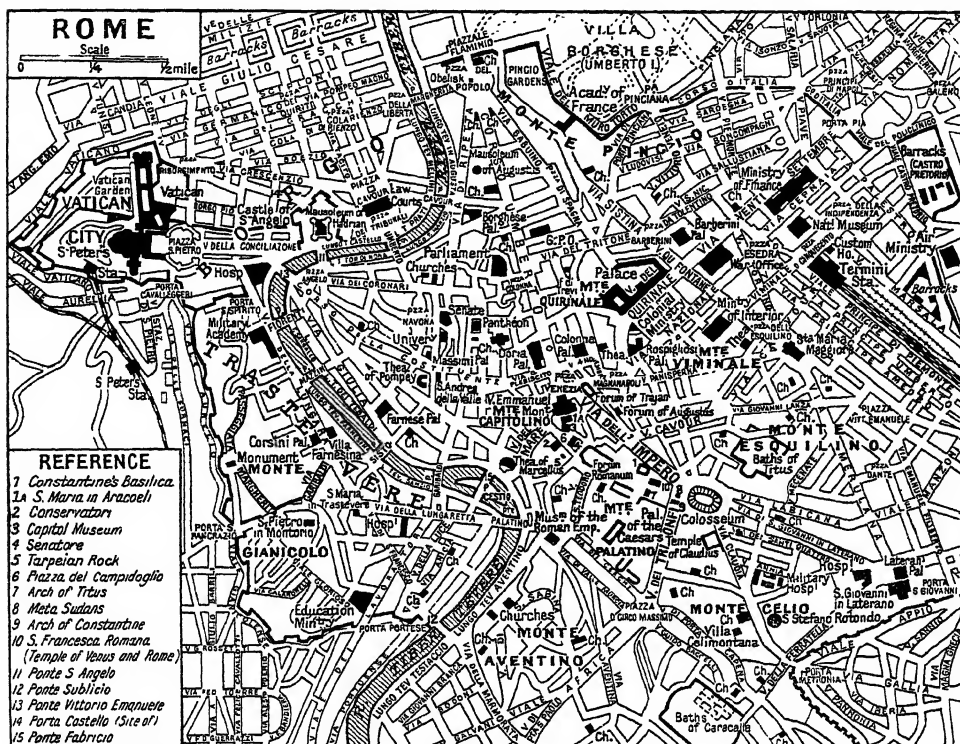
the demands of modern traffic and the claims to preservation of buildings of artistic and historical importance will never be found.

The most prominent buildings of the modern city are the huge monument to Victor Emmanuel II, on the north side of the Capitol, the law courts, on the right bank of the Tiber, the new Chamber of Deputies, the Banca d'Italia, and the principal civil hospital, the Policlinico. None of them is quite worthy of its surroundings. The embankment of the river caused the removal of much that was picturesque, as did the construction of the Via dell'Impero and other works of fascist Italy. These changes led to the discovery of many ancient remains, and often to their inevitable destruction. Much has, however, been done in



English names of places indicated by numbers. 1. Baths of Alex. Severus. 2. Temple of Jupiter (Capitol). 3. Temp. of Mater Matuta (Cattle mkt.). 4. Temp. of Ceres. 5. Arch. of Constantine. 6. Arch. of Janus with four faces. 7. Temp. of Minerva. 8. Colon. of Octavia. 9. Basilica of Trajan. 10. Forum of Trajan. 11. For. of Augustus. 12. For. of Nerva. 13. Stadium of Domitian. 14. Temp. of Isis and Serapis. 15. For. of Vespasian. 16. Col. of Marcus Aurelius. 17. Crematorium. 18. Swine Mkt. 19. Camp of Praetorian Guards. 20. Circus of Caligula. 21. Training Stables. 22. Sundial. 23. Concert hall of Domitian. 24. Voting enclosures of Julius Caesar. 25. Public Villa. 26. Provision Mkt. of Livia. 27. Cattle Mkt. 28. Golden House of Nero. 29. Court of Law. 30. Great Circus.

31. Tem. of Queen Juno. 32. Grove of Furrina. 33. Tem. of Jupiter and Liberty. 34. Granaries of Galba. Roman Forum. 1. Arch. of Titus. 2. Tem. of Vespasian. 3. Arch. of Septimius Severus. 4. For. of Peace (of Vespasian). 5. Col. of Diocletian (Phocas). 6. Orators' platforms. 7. Black Stone. 8. Arch. of Augustus. 9. Spring of Juturna. 10. Tem. of Vesta. 11. Tem. of Marcus Aurelius and Faustina. 12. Mamertine dungeon. 13. Senate House. 14. Voting place. 15. Record office. 16. Pool of Curtius. 17. Altar of Julius Caesar. 18. Palace of Numa. 19. House of the Vestals. 20. Granaries. Latin terms and their equivalents in English: *Aqua*, aqueduct; *colis*, hill; *horti*, gardens; *mons*, hill; *pons*, bridge; *porta*, gate; *thermae*, baths; *viciis*, street.



Rome. Plan of the capital city of Italy, showing the principal churches and public buildings

way of laying bare the remains of the Forum and Palatine, and many other buildings, in order that they may remain permanently visible. The region extending on both sides of the Via Appia and bounded by the city walls has been made into a public park, under the name of the *Passaggiata Archeologica* (archaeological park); but unluckily no excavations were made on the site before the park was laid out. The fascist government under Mussolini was particularly active in pulling down medieval and later buildings in order to unearth remains of the ancient city. To Mussolini also is due the imposing *Via dell'Impero* which, linking the forum of Julius Caesar and the Trajan column with the Colosseum, provides a fine vista of the latter building. We may also note the construction of a tunnel under the Quirinal hill, 1902. The municipal government of the city of Rome is in the hands of the *sindaco* or mayor and a council.

Rome is also the seat of government of Italy. The Vatican City (*g.v.*) is extra-territorial. The population of Rome has increased rapidly since 1870, when it was

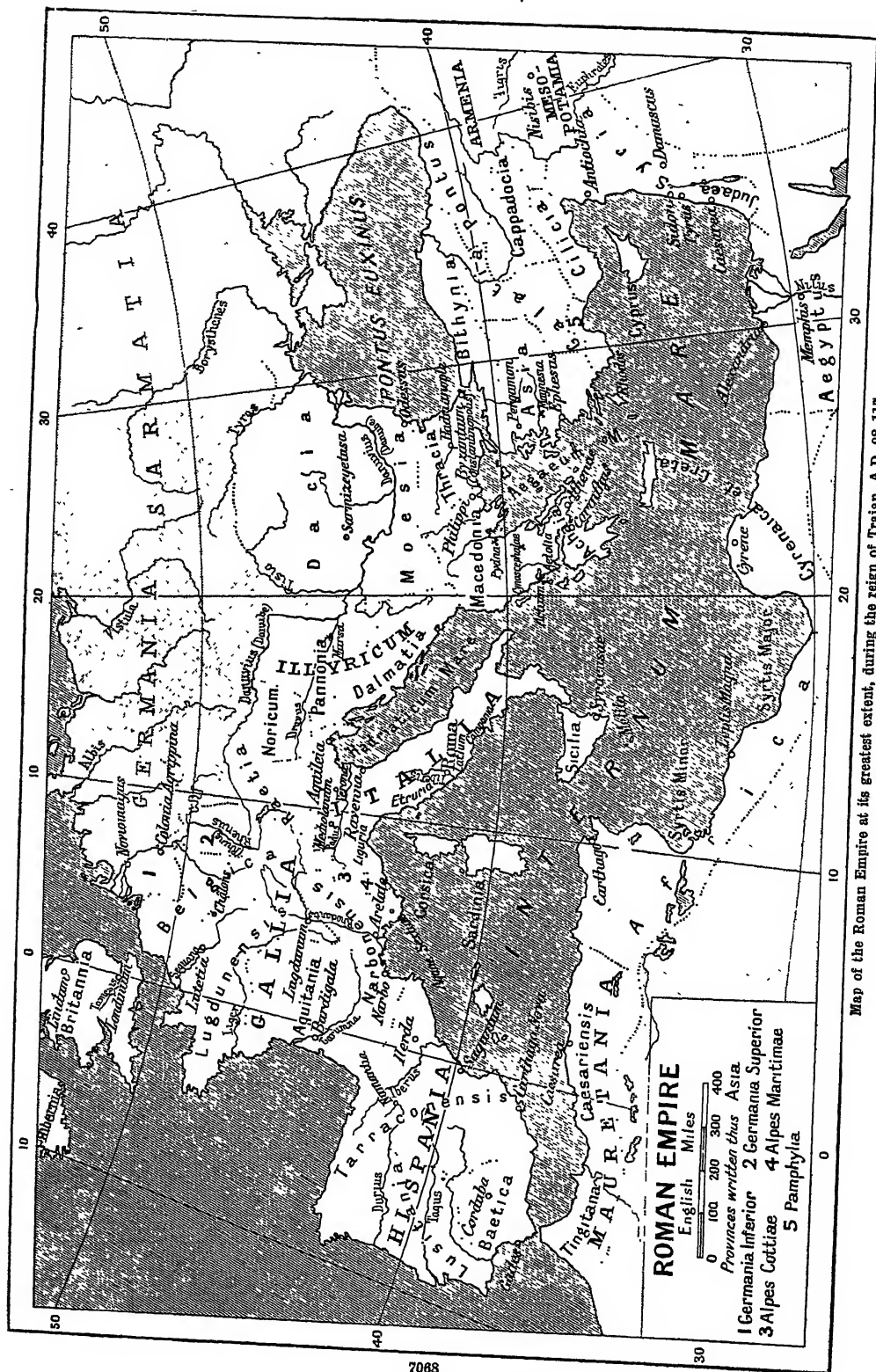
only 226,022. This is mainly due to its importance as the seat of government and as a city visited by tourists, for it has no trade or industries.

Besides the many buildings of interest of all periods which it contains, Rome is richer in museums and picture galleries than almost any other city in Europe, and this despite the fact that very many of the art treasures which it still possessed in the 18th century have since then been transported elsewhere.

During the Second Great War, the only damage suffered by the monuments of Rome occurred July 19, 1943, during an air attack by U.S. bombers, on the rly. marshalling yards, when a bomb fell on S. Lorenzo fuori le Mura; the damage, however, was repairable. Two breaches of 50 ft. and 15 ft. were also made in the Aurelian Wall. There was a second heavy air raid on military targets near Rome on Aug. 13, and next day the Badoglio govt. declared Rome an open city. After the surrender of Italy in Sept., Badoglio's govt. and the royal family abandoned Rome, which was then garrisoned by

German troops. More than 5,000 tons of bombs were dropped by Allied aircraft on neighbouring airfields in the week before the landings at Anzio on Jan. 22, 1944. On June 4, U.S. troops of the 5th army reached Rome. There was stiff fighting on the E. and S. edges of the city; but the main German forces had withdrawn earlier. Occupation of the city was completed during the day, and Rome became the seat of Italian govt. again on July 15.

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ROME: THE WESTERN EMPIRE

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This sketch of the history of the Roman empire is supplemented by articles on the emperors, Augustus; Nero; Trajan, and others; and on great Romans such as Caesar Julius; Scipio; while it is carried further in those on Byzantine Empire; Italy; Papacy. See also Carthage and entries on Plebeians; Senate; Tribune, and other institutions. For Roman literature see Latin and articles on Cicero; Tacitus, etc. See also Roman Law; Villa

The date accepted by Roman antiquaries for the foundation of Rome was 753 B.C. The earliest glimpses which we can get of the Romans present them to us as a community whose existence depended on agriculture and war. What is known as "land-hunger" played a very great part in Roman history. Early Rome must have been engaged in almost incessant warfare. The right bank of the Tiber was in possession of the Etruscans, alien to all other races of Italy, and the mountains in all directions were beset by turbulent raiders, Aequians, Volscians, and others. The inhabitants of the plains of Latium, the Latins, were closely akin to the Romans. Rome was originally a member of a confederation of Latin-speaking communities, of which she was a principal defensive outpost. Nothing but a very closely knit military and civil organization could have

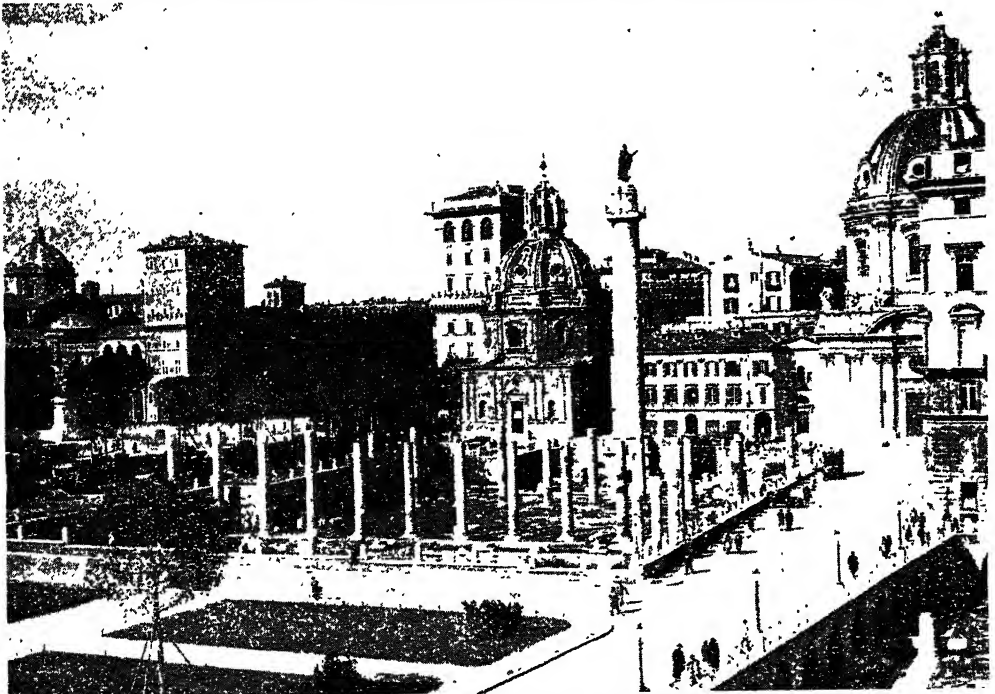
enabled Rome to exist in the earliest period.

The Roman polity rested on an idea of authority in many respects unlike anything found in any other ancient state. The word for this was *imperium*, and its possessor in early days exercised absolute sway over all affairs, military, civil, and religious. That there was a monarchical period in Roman history is made certain by many things that survived into the late Republican age. The change from monarchy to Republic involved, as Cicero says, no change in the quality of the *imperium*.

The changes were: (1) the *imperium* was put into commission and held jointly by two persons; (2) the tenure of it was limited to a year; (3) the whole body of burgesses, i.e. the whole body of warriors, had a voice in the appointment, as was natural, since the appointment was, first and

foremost, a choice of commanders over the army. The principle of collegiality was established in connexion with all offices subsequently created. Exercise of a function by an officer who had no colleague was very exceptional. The principal example is afforded by the dictatorship. The difficulties which would certainly arise from the exercise of power by two joint holders of equal privilege must have been foreseen on the institution of the Republic. They were met by the singular practice whereby either of the two principal magistrates (called *praetores* at first, afterwards *consules*) might nominate a dictator, who held supreme authority for six months over citizens and ordinary magistrates. He appointed a subordinate officer, called *magister equitum* (master of the horse).

The first great step made by Rome towards empire was by obtaining control over the Latin League of cities, of which she had been at first an equal member. This was achieved finally, after a good many generations of strife, in 338 B.C. on the close of a serious war. The control of the Greek cities in Campania was obtained about the same time, and soon after the Etruscan power, once the greatest



Rome. The forum of Julius Caesar, with Trajan's column in the centre, seen across the N.W. end of the via dell' Impero. In the background (left) is the Palazzo Venezia, the German embassy before the First Great War; from a balcony here Mussolini was accustomed to harangue the Romans assembled in the Piazza Venezia, in front of the palace

in Italy, was subjugated, and by the beginning of the 3rd century B.C. Rome had the control of the whole peninsula. The complete domination of some parts of it was not, however, attained until later times. Thus the Ligurians, in the mountain regions above the Riviera, and the Gallic tribes on the Alpine slopes were not completely subjugated until the age of the emperor Augustus.

In this course of conquest in Italy Rome adopted a policy towards conquered peoples which was continued outside Italy and was the principal cause for her rise to empire. She kept all foreign relations in her own hands, but interfered as little as possible in the internal government of the subject communities or tribes. And she was most moderate in the burdens cast upon her subjects. The chief requirement was that of military service, which the primitive peoples were ready to give. Taxation was seldom required of Italians. This politic moderation on the part of Rome explains why Rome was the only ancient city state which succeeded in founding a stable empire.

Struggles with Carthage

The Greek cities of S. Italy struggled continually against the Italic barbarians, Lucanians, Brutians, and others, and from time to time had summoned Greek commanders to their aid. The venture of Pyrrhus, king of Epirus, who came over to aid Tarentum early in 280 B.C., brought Rome on to the southern scene, and completed her ascendancy in Italy. One result of this contest was a rupture between Romans and Carthaginians, who had previously been allies. After three great struggles (264-241 B.C., 218-201, and 149-146) Carthage was utterly destroyed. The first war was chiefly naval in character. It resulted in the first Roman annexation outside the peninsula, the Carthaginian possessions in Sicily. Immediately after this event Corsica and Sardinia were wrested from Carthage.

In 230 and 219 wars were waged against the Illyrian pirates, and some points occupied on the Eastern Adriatic shore. Rome was thus brought into political contact with the communities of Greece proper. Philip V of Macedon allied himself with Hannibal, and the Aetolian Confederation with Rome, during the Second Punic War. Immediately after Hannibal had departed, war was declared against Philip, who was overthrown by Flaminius at the battle of Cynoscephalae, in 197 B.C. In the following year Flaminius declared the "liberation" of Greece, following the an-

cestral Roman policy of respecting the internal autonomy of the separate cities, while looking with disfavour on leagues or combinations of cities or tribes.

Philip was crippled by this measure of "liberation," but the Romans annexed for themselves none of his territory. Philip had been aided by Antiochus, king of Syria, who was next attacked by Rome. After his crushing defeat at Magnesia, 190 B.C., he was treated very much as Philip had been. Roman allies, Eumenes king of Pergamum, and the Rhodians who headed a confederation of commercial cities, received accessions of territory. Philip, who had rendered very important assistance against Antiochus, was shabbily treated and consequently nursed dreams of revenge.

In the contests with Philip and Antiochus, two great Greek federations, one of the Aetolian, and the other of the Achæan cities, had been deeply concerned. The dissensions generated by the struggles led ultimately to the violent suppression of both by the Romans, the former in 189 B.C., the latter in 146, when Corinth, the great Achæan centre, was razed to the ground.

At the end of the Hannibalic War, only a narrow band of territory in Africa had been annexed. In 146 it was enlarged. The Third Macedonian War, against Perseus, concluded by the victory of Pydna, 168 B.C., made an end of the Macedonian monarchy, and Achæa, with Macedonia, went to form a province. From the time of the Second Punic War onwards the Romans had been occupied by strenuous struggles to establish their ascendancy in Spain, suffering from time to time great disasters. The capture of Numantia by the younger Scipio in 133 gave them more security, but Spain was still turbulent in the time of Augustus. In 133 the last king of Pergamum bequeathed his dominions to Rome, and they became the Roman province of Asia. About the same time the first steps were taken towards the conquest of Gaul. In 124 Aquæ Sextiæ (Aix in Provence) was founded, and six years later the Roman colony of Narbo (Narbonne), the first organized Roman settlement outside the peninsula.

Measures of the Gracchi

In the period from 133 to 121 the revolutionary measures of the Gracchi were carried out, and the supremacy of the compact ring of noble families which had controlled the Senate was undermined. The chief measures were: (1) the vindication of public ownership in

the national estates. (2) The constitution of the *equites* as a separate order. (3) The attempt to found great Roman colonies across the seas. Gaius Gracchus proposed to enfranchise the Italian allies. The refusal to pass this measure led a generation later to the Social War, which had for its result the acquisition of Roman citizenship by all the cities of Italy, by the *lex Iulia* of 90 B.C. The conception that men of Italian birth formed a people apart from the rest of the empire was now definitely established, with important consequences.

End of the Republic

The last annals of the Republic were filled with the struggles for control of the Roman polity between military commanders—the Scipios, Marius, Sulla, Pompey, Julius Caesar, and Mark Antony—and then the Republic perished. The imperial system itself emerged from a great scene of bloodshed, within and without Italy. The final decision in favour of Augustus at the great naval battle of Actium raised him to undisputed dominance in 31 B.C. Julius Caesar merely destroyed the Republic; and paid the penalty with his life. His successor had what he had not, the constructive spirit. So vast a transformation was surely never carried through with such consummate ease.

In the preceding century great portions of Asia Minor, also Egypt and Gaul and lands by the Danube, had been incorporated in the empire. An actual autocracy was established, so cunningly veiled that its methods presented themselves to the Romans as a natural and easy development from those of the Republic. A world weary of war greeted gladly one who posed as a prince of peace.

Such quietude and material prosperity as subsisted with few interruptions for two centuries, had never been known to the ancient world since the dawn of history. Even the extinction of the great founder's line when Nero perished, A.D. 68, shook the foundations of the imperial edifice but little. The commotion which swept away Nero was due to a consciousness among the legionaries, posted by Augustus in great permanent camps on the boundaries of the empire, by Rhine, Danube, and Euphrates, that the imperial power rested on their support, and might be bestowed by their grant. The Julio-Claudian line was succeeded by the nominees of the Eastern forces in the person of Vespasian; then there was an interlude under Nerva, when the Senate, whose formal right to a voice in the

appointment of an emperor had been recognized from the first, succeeded in making the right effective.

Then followed soldier emperors of great ability, Trajan and Hadrian, and after them the Antonines, the best governors of the whole imperial period. The philosopher-emperor Marcus Aurelius gave place to a feeble and vicious son, Commodus; on his assassination, A.D. 180, military nominations followed for several generations, often due to anarchic action by the legions, each great army striving to set its commander on the throne, in order to secure the largess to be obtained by success. The 3rd century was chaotic from this cause, until some men appeared whose powers were strong enough to give them secure control.

Aurelian and Diocletian

Aurelian, in 270, found the empire ready to crumble away owing to internal weakness and dissensions, and the formidable assaults of Germanic tribes, chiefly the Goths, Franks, and Alamanni. The pressure of the barbarians was due greatly to need of land, in large part caused by tribes in the far East, driven westward by the same necessity. The emperors adopted the policy of allotting vacant lands within the empire to the newcomers from time to time, in return for military service, an utterly ineffectual policy. Large portions of the empire rapidly passed from civilization to barbarism. To a great extent these aliens filled the ranks of the army, and high officials of patently barbaric origin swayed the destinies of the empire. In 282 a vigorous emperor, Probus, was murdered by his soldiers, and after an interval of confusion Diocletian, one of the greatest of the emperors, succeeded, and a new era began for the empire.

After Augustus, Diocletian was the greatest political organizer that Rome ever had. He tried to reconstitute all the imperial institutions in such a manner as to remove a number of sores which were threatening destruction to the body politic. (1) He tried to devise a method whereby succession to the throne should take place peacefully. He placed the supreme power in commission. There were to be two emperors-in-chief, called Augusti. Each of these was to nominate an assistant to bear the title of Caesar, and at the end of 20 years' tenure of office, the Augustus was to retire, being succeeded by the Caesar, who would have received a thorough training for the work of a ruler. For administrative purposes, the empire was divided

into two spheres, an Eastern and a Western, and each of these spheres again into two. In practice the four sections had for their superintendence one of the four imperial personages, while the two Augusti settled matters of universal concern in common.

(2) The provinces were split up into smaller portions. It would thus be very difficult for an ambitious governor to find sufficient resources near at hand to make himself dangerous to the supreme authority. Diocletian preserved the provincial councils, a very beneficial creation of Augustus. (3) The complex hierarchy of officials was thoroughly reorganized with a view to efficiency. (4) The immobility of the legions, stationed by Augustus permanently on the frontiers, had conduced to chaos, and Diocletian created a mobile army. (5) A great council of the Empire (*Consistorium*), with definite constitution and powers, was organized. (6) A vast and urgently needed reform of the coinage was begun, and completed by Diocletian's successor, Constantine. (7) A great and uniform organization of finance was undertaken. The land became the chief basis of taxation.

Growth of Despotism

The whole scheme was but partially successful, but it undoubtedly stayed the previously imminent ruin. Several processes, which had been for many generations gradually stealing over the empire, now reached their full development. (1) The monarchy, at first a despotism unavowed, and for that very reason less oppressive, now became frankly autocratic. (2) The empire started as in essence a vast confederation of communities invested with a great degree of local autonomy. But the central power had been continually encroaching on the privileges of the innumerable civic communities of the empire. These were ruined by bad financial administration, which was aggravated in some respects by the changes which Diocletian introduced.

Responsibility for the production of the taxes was laid on the municipal councils, with the result that local interest and initiative were paralysed. No one of the causes which can be assigned to the fall of the Roman empire was more potent than this. (3) A disastrous tendency developed towards a kind of social caste system. Caracalla, in 212, had made all the subjects of the empire citizens with nominally equal privileges before the law; but these privileges came to be of little value to the general mass. By the require-

ments of the state, men were deprived of anything like free choice in ordering their lives. Thus sons of soldiers were obliged to adopt the military career.

The class from which municipal councillors were drawn were subjected to such compulsion that any method of escape was welcome, even that of ordination in the Church—for the Christian empire left the clergy free. In the eye of the government the real object of the cultivator's existence was to produce taxes; he therefore sank into serfdom, and his children after him. So the greater part of the world became bound in chains. (4) A progressive Orientalisation of the Imperial Court took place, which rendered it a hotbed of intrigue. The Eastern idea that a monarch is in some sense divine, introduced by Augustus, thoroughly transformed the atmosphere. The whole public service became servile and corrupt.

Acceptance of Christianity

The attempts made to cure these evils ever became more strenuous and severe, and always failed. (5) The old Roman Senate, treated with outward respect by Augustus, became little more than a local council for the city of Rome. (6) Italy lost her pride of place, and became even as the extra-Italian provinces. (7) The official acceptance of Christianity by Constantine introduced a disastrous intermingling of politics and religion. Heresy now became a thing of infinite political consequence. (8) Rome was deprived of its pre-eminence by Constantine, who in 330 gave the famous old Greek city Byzantium a new name, Constantinopolis, after himself. The new capital was settled after the model of old Rome. Even in Italy, old Rome ceased to be the unrivalled city of the rulers. Late emperors held court frequently at other places, especially in the cities of Milan and Ravenna.

In 337 Constantine died. In the following year the three Augusti, his three sons, divided the empire. The East fell to Constantius, Illyria and adjacent parts to Constantine II, and the West to Constans. A year after this partition Constans attacked and killed Constantine II, and annexed his dominions. In ten years' time a formidable pretender, Magnentius, drove Constans to his death, and reached Rome. In 351 Gallus, nephew of Constantine and brother of Julian the Apostate, was recognized as Caesar, and Magnentius was overthrown by Constantius, at Mursa in Pannonia.

In 360 Julian became Caesar and Constantius died. Next year Julian

entered Constantinople as emperor, and re-established the old heathen cults. On his death in the war with Persia the soldiers raised to the throne Jovian, who reinstated the Christian religion. Jovian was assassinated, and Valentinian I, the son of a Pannonian peasant, became Augustus, and bestowed the same honour on his brother Valens. Valentinian established himself at Milan, Valens at Constantinople. Procopius, a trusted officer of Julian, raised the standard of revolt against Valens in Constantinople, 365, but lost his life in the next year. Valentinian, on the whole a strong general, and successful for long against the barbarians, died on a campaign in 375. Valens, while operating against the Goths, suffered at Hadrianopolis a terrible defeat, which forms a turning point in history, and lost his life. His nephew Gratian assumed as colleague a stout and successful soldier, Theodosius.

In 382 Gratian removed from the Roman Senate-house the altar of Victory, the last heathen symbol that remained there. He was treacherously captured and killed, 383, by an upstart emperor, Maximus, in Gaul, where a Frankish general, Arbogast, who had held the real power for some years, nominated Eugenius as emperor, intending to rule through him. A great struggle between forces from the West, chiefly Franks and Gauls, and the army of Theodosius from the East, took place on the river Frigidus, near Aquileia, where Theodosius won a great victory and Eugenius was killed; Arbogast committed suicide 388, and Valentinian resumed control of the West, but met his death in 392. In 395, on Theodosius's death, his son Arcadius became ruler of the East; another son, Honorius, had been declared Augustus in the West the year before his father's death, with Stilicho as his general. This involved the real, though not nominal, division of the Roman empire into two empires.

Domination of the Germans

The consequences of this split are obvious in Europe to this day. Stilicho held the Gothic chief Alaric in check for a while, but in 400 Alaric made his way into Italy; however, in 402, Stilicho won over him two great victories at Pollentia and Verona. In 405 another barbarian, Radagaisus, penetrated Italy, but he and his forces were destroyed by Alaric. Gaul also at this time was being ravaged by the barbarians. But long ere this the Germans had become the controlling element in the European dominions of Rome. Both military

and civil services were controlled by men of Germanic origin, and large districts were peopled by their kinsmen.

Only a few more incidents in the dying agony of the Western empire remain to be mentioned. By the end of the first quarter of the 5th century the Goths had overrun Italy and Gaul; the Franks and Alamanni held the Rhine-lands, Vandals and Germans were in Spain, Vandals were in Africa. In 439 they possessed themselves of Carthage, the great and brilliant stronghold of Roman civilization there. Shortly afterwards Attila led his hordes of Huns to the plunder of the Eastern empire. In 451 he reached Gaul, where he suffered a tremendous defeat at the hands of Theodoric the Visigoth, near Châlons. In 453 he died in Rome, which had been sacked by Alaric in 410, was plundered by Vandals in 455, and once more by Ricimer, a pure German, who had been made commander of the armies of the West. Ricimer repeatedly set up shadowy emperors according to ancient form, but was real ruler himself.

The last titular emperor, named by an irony of destiny Romulus Augustulus, 476, was pensioned by the barbaric leader Odoacer. Europe had already been parcelled out into barbaric kingdoms.

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ROME: ITS ART AND ARCHITECTURE

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In addition to the illustrations herewith, Roman art is illustrated under a great number of headings throughout this work. These include Aqueeduct; Arch; Capitol; Colosseum; Forum; Pantheon; S. Peter's and those on the sites where Roman remains exist, e.g. Nîmes; Rimini; and others. See also Art; Architecture; Etruria; Numismatics; Pottery

The Romans were not by nature highly endowed with the artistic faculty, and during the Republican period, when they were engaged in a perpetual struggle, they were, as a rule, content to employ the services of foreign artists, whether Greek or Etruscan, in the erection and adornment of their temples and other buildings. Examples of Roman craftsmanship, such as the *cista* or engraved casket made by Novius Plautius, and found at Praeneste, show a close adherence to Greek models.

We can, however, trace connexion between Etruscan art—especially in the realism of its portraiture—and that which afterwards flourished in Rome. Again, even in republican times, the art of the Romans was closely wedded to history. We possess a fragment of an historical painting from the Esquiline, which seems to represent episodes of the Samnite wars, and reminds us of the traditions of Fabius Pictor (the Painter), who adorned the temple of Salus with frescoes in 304 B.C., and of the paintings carried in triumph by successful generals. An impulse

was given to the art of portraiture by the practice of setting up waxen busts of the more famous members of the great families of Rome in the *atria*, or courts of their houses. These may have been at first derived from death-masks, but in time marble busts were substituted, and by the last century of the Republic we find a flourishing school of portraiture in existence. Caesar, Pompey, and Cicero are all represented in extant busts.

The enormous increase in wealth due to the conquests of Rome and the diffusion of Hellenic culture, led to the collection of Greek masterpieces, great numbers of which were transported to Rome by victorious generals, and to the multiplication of copies for the decoration of the palaces and villas of those who could not acquire originals; and a school arose in which, instead of direct copying, adaptation of earlier Greek types was practised. Its founder was Pasiteles, a contemporary of Caesar.

The establishment of Roman supremacy in the Mediterranean world naturally made the capital a centre of artistic production, and

Augustus was not slow to turn this to account. It is, of course, difficult to say how far the works which may be assigned to his reign were the product of Roman craftsmen; but at least we may see a truly Roman spirit in the close association of art with history. The statue of Augustus himself from Prima Porta, with its allegorical decoration and accessories, is the first, but also the finest, of the series of imperial statues.

In addition to sculpture, other arts, such as those of the gem-engraver and the silver chaser, were made to serve the ends of the dynasty. The *Grand Camée* of the Bibliothèque Nationale represents Tiberius and Livia, above whom the deified Augustus hovers; the silver cups from the villa of Bosco Reale, near Pompeii, now in the Rothschild collection, bear reliefs which celebrate the triumphs of Augustus and his successor. But the most perfect expression of Roman-Imperial art is found in the historical monuments decorated with reliefs, which begin with the Ara Pacis Augustae, executed between 13 and 9 B.C., to celebrate Augustus's pacification of the West, several slabs of which have been preserved.

Pompeian Art

The triumphal arch and the trophy, especially the former, gave free scope to this form of national art. At the same time, we can form some conception of the art which ministered to private luxury from the series of decorative wall-paintings from Rome and Pompeii, in which two parallel tendencies, one towards the creation of an illusory outlook on to an external landscape, and the other towards the representation of the masterpieces of easel-painting, exert a mutual influence. A good example is the wall of the dining-room in the house of Livia on the Palatine. Impressionist landscape is a common form of decoration, and stucco is used with remarkable skill for like purposes. The combination of both—as the scanty surviving fragments, compared with certain tomb-decorations, prove—achieved its culminating triumph in the decorations of the Golden House of Nero.

The comparative lack of public monuments belonging to the Julio-Claudian period is compensated for by their abundance in that which follows. Under the Flavian emperors Roman sculpture reached its zenith; the reliefs of the arch of Titus solve the problem of giving the atmosphere, which painting supplies by more direct

means, to compositions which retain full plastic effect. The best portraits of this period are masterpieces of art, giving the essential and significant traits of the subject without meticulous detail.

In the reign of Trajan the technical perfection of execution rapidly declined, but historical art entered on a new phase with the spiral reliefs of the column set up in the Basilica Ulpia, which tell the story of the emperor's Dacian wars, in what has been termed the "continuous style," usually unfolding its successive scenes as on a scroll, but sometimes summing up the narrative in a broad panorama. We begin in this period to see the tendency to overcrowding, and the objection to vacant intervals which leaves no space unadorned. The triumphal arch of Trajan, at Beneventum, the reliefs of which are full of historical significance, and almost fulfil the function of an Imperial programme, is thus overcharged with ornament. Roman sculptors, again, excelled in the execution of barbarian types, statues of captives playing a large part in the decoration of triumphal monuments; and in the reign of Hadrian, whose Greek tastes led to a revival of classicism, personified provinces were added. The portraits of the Emperor's deified favourite Antoninus furnish the best illustration of the tendencies of the time.

Declension of Standards

Throughout the succeeding period we can trace a gradual declension from the classical Hellenic standard, and the invasion of new artistic principles, which are thought by many critics to be derived from the East. Sculpture endeavours by an increased use of chiaroscuro to obtain some of the effects of painting, but fails to convey the impression of movement in a free atmosphere, and has to be content with that of an intricate pattern of lights and shadows. Various experiments are made, such as the detachment of puppet-like figures from the background in a relief from the base of the Antonine column; and the sense of proportion and perspective is lost in the bird's-eye reliefs from the Arch of Septimius Severus. The sarcophagi of the wealthy, which represent to us the private art of this time, show the same tendencies in their crowded compositions. Portrait sculpture, however, remains at a high level, especially in the amazingly frank characterisation of the busts of Caracalla. In the decoration of private houses mosaic played an important part, and here, too, artistic tradition was

well maintained, and taste in decoration declined but slowly.

The 3rd century A.D. was a time of strife and decay, and art is mainly represented by a series of imperial portraits, many of which are still of remarkable excellence. That of Philip the Arabian, rough as the artistic methods are, is a marvellous character study, and there was even a revival of art in the troubled times of Gallienus, as that emperor's busts prove.

Economic exhaustion hastened the decay of art, and when order was re-established by Diocletian and Constantine, the impulse given by Hellenism was practically exhausted, and, with the triumph of Orientalism, sculpture virtually ceases to be the embodiment of life, and becomes purely monumental, though in its best examples—such as the colossal portrait of Constantine—undeniably grandiose. Symmetry and frontality, the marks of primitive art, characterise the reliefs of this time, e.g. on the arch of Constantine, and in fact we are in the presence of the death of an old and the birth of a new—i.e. Christian—art, which works up what remains of the historical and monumental genius, informing Roman imperial art in the service of the conquering religion.

Besides the art whose story we read in the imperial monuments, the handicrafts flourished under the early empire. Gem-cutters and die-sinkers excelled in their several spheres, and the imperial coin portraits and medallions embody much first-class workmanship. The provinces, too, had their schools, in which pottery, brasswork, and sculpture, often valuable for its realism, set up centres of artistic tradition. The tombstones and other monuments of Roman officers or rich provincials furnish the best examples of this. Even in Britain, sculpture was a living art, as is witnessed by the Gorgon, which decorated the pediment of a temple at Bath.

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Rome. City of Georgia, U.S.A., the co. seat of Floyd co. It is situated at the confluence of the Oostanaula and Etowah rivers, 71 m. N.W. of Atlanta, and is served by the Southern and other rlys. The buildings include the city hall. Peaches and other fruit, grain, and cotton are important products of the locality marketed here

Industrial interests are chiefly rayon. Rome was settled in 1834, and became a city in 1847. Pop. 26,282.

Rome. City of New York, U.S.A., a co. seat of Oneida co. It stands on the Mohawk river, 16 m. N.W. of Utica, and is served by the New York Central and the New York, Ontario, and Western Rlys., and the Erie, New York State Barge, and Black River canals. It contains the Rome Free Academy and the Jervis library. Among its manufactured products are brass, iron, and copper ware, canned goods, motor vehicles, locomotives, and cheese and butter are also produced. Founded in 1796, Rome was incorporated in 1819, and became a city in 1870. Pop. 34,214.

The spot where Rome stands was, in the 18th century, an important portage on the route from the valley of the Mohawk to Lake Ontario. The Indians used and named it, and early in the century the English built forts hereabouts, which were attacked by the French. In 1756 a new fort, called, after its builder, Fort Stanwix, was erected, its name being afterwards changed to Fort Schuyler. Held by the colonists on the outbreak of the war of independence, it was besieged in 1776 by a British force, but this was compelled to retire. The defence made was a great encouragement to the Americans, and it is said that the name of Rome was given to the town that sprang up on the spot because the republic had been defended heroically here.

Rome-Fee or **ROME-SCOT.** Name for the hearth tax imposed by the pope on England and other countries, subsequently known as Peter's Pence (*q.v.*).

Romeo and Juliet. Tragedy by Shakespeare. Romeo, a Montague, and Juliet, a Capulet, fall in love and are secretly married. Romeo's friend, Mercutio, being killed by Juliet's cousin, Tybalt, in a brawl arising from the rivalry of the Montagues and the Capulets, Romeo kills Tybalt, and is banished from Verona. Her family plan to marry Juliet to Count Paris, while she, seeking advice from Friar Laurence, who married her to Romeo, swallows a powerful sleeping potion, and is laid, as dead, in the family tomb. A message sent to Romeo miscarries, Romeo and Count Paris meet at the tomb, Romeo kills the count, and, thinking Juliet dead, poisons himself by her side. Juliet awakens, and, seeing the dead Romeo, fatally stabs herself with his dagger. The family feud ends over the dead bodies of

the lovers. The tragedy is lightened by the characters of Mercutio and Juliet's old nurse. The scenes are laid in Verona and Mantua.

The story appeared in the Novellino of Masuccio di Salerno, 1476; was told by Luigi di Porto, as *The Story of Two Noble Lovers*, printed at Venice, 1535; was retold by Bandello, 1554; told again, in French, by Boastuau, whose version formed the basis of a poem by Arthur Broke, 1562, and was translated in Painter's *Palace of Pleasure*, 1567. Shakespeare's play was written and probably acted in its first form as early as 1591, was first published in a mutilated form in 1597, other quartos following in 1599 and 1609, the last named supplying the basis of the folio text of 1623. Of its 3,002 lines, 405 are prose, 2,111 blank verse, and 486 pentameter rhymes. It has been many times revived, an especially noteworthy revival being at the New Theatre, London, in 1935, with John Gielgud, Laurence Olivier, Peggy Ashcroft, and Edith Evans. In 1937 there appeared an American film version, with Leslie Howard, Norma Shearer, and John Barrymore.

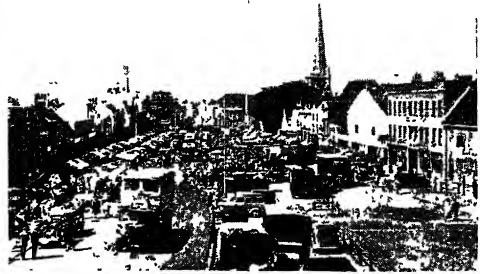
Römer, OLE, OLAF, OR OLAFS (1644–1710). Danish astronomer and mathematician. Born at Aarhus, Jutland, Sept. 25, 1644, and educated at Copenhagen university, he went to Paris in 1671, where he became teacher of the dauphin and a member of the academy. He was appointed professor of mathematics and director of the observatory at Copenhagen, 1681, and died there, as burgo-master, Sept. 19, 1710. Römer was the first man to discover that light had a finite velocity, and he calculated its speed from observing an eclipse of the first moon of Jupiter. He was the inventor of the astronomical instrument known as the meridian circle. His observations on the immersions and emissions of Jupiter's satellites were the basis of celestial measurements called Römer units.

Rome Scholarships. British academic awards in archaeology, history and letters, architecture, painting, sculpture, and engraving, made by the faculties of art in

those subjects of the British School at Rome. A British student winning one of these awards can spend two years studying his subject in Rome. The scholarships, founded in 1913, and awarded in normal times annually, are worth £250 p.a. There is a public exhibition of works submitted.

The British School at Rome (London office, 1 Lowther Gdns., S.W.7) was founded in 1901 as a school of archaeology. In 1911 it was reconstituted to include faculties in the further subjects mentioned. The school has accommodation for 24 students. The building, designed by Lutyens, stands in the Valle Giulia, overlooking the gardens of Villa Borghese; it escaped both injury and confiscation during the Second Great War.

Romford. A mun. bor. and market town of Essex, England. It stands on the Rom, a small tributary of the Thames, 12 m. by rly. N.E. of London. The chief



Romford, Essex. A busy market day scene

building is the modern church of S. Edward the Confessor, the successor of a much older one. The main industry is brewing, but there are light engineering and other works. Cattle and corn markets are held in the town. The Romans had a station called Durolitum here, and in the Middle Ages Romford was the chief place in the liberty of Havering, which ceased to exist in 1892. An arterial road runs from Woodford and Wanstead to Romford. Market days, Wed., Fri., and Sat. Pop. 72,519.

Romilly, JOHN ROMILLY, 1st BARON (1802–74). British lawyer. Son of Sir Samuel Romilly, he was born Jan. 10, 1802, graduated at Trinity College, Cambridge, 1823, and was called to the bar in 1827. He entered parliament in 1832,



1st Baron Romilly, British lawyer

became solicitor-general, and was knighted in 1848. Attorney-general, 1850, he became master of the rolls, 1851. He introduced various chancery reforms and was the last master of the rolls to sit in the commons. Created Baron Romilly of Barry in 1865, he resigned his mastership of the rolls in 1873, and died Dec. 23, 1874. The title came in 1905 to William, 4th baron (b. March 8, 1899).

Romilly, Sir Samuel (1757-1818). A British legal reformer. Born, of Huguenot descent, in



Sir S. Romilly,
British lawyer
Sir T. Lawrence

London, March 1, 1757, he had a private education and entered Gray's Inn in 1778, being called to the bar in 1783. He was deeply influenced by his study of Rousseau, the

Encyclopédistes, and Beccaria, and became a strong advocate of humanitarian principles in criminal law. In 1806 he became solicitor-general, and he was an M.P. thenceforward until his death. Romilly secured the abolition of the death penalty for certain classes of petty theft, and consistently supported measures of reform and emancipation. An able speaker and a learned lawyer, he cut short a distinguished career by suicide, Nov. 2, 1818, following the death of his wife. *Consult* Life, C. G. Oakes, 1935.

Romilly-sur-Seine. Town of France, in the dept. of Aube. It stands on the left bank of the Seine, 23 m. N.W. of Troyes. It has locomotive works and stocking and needle factories. In the Cistercian abbey of Scellières, 2 m. N.W. of the town, the body of Voltaire was interred in 1778, but was transferred to the Panthéon in Paris, 1791. Pop. 13,314.

Rommel, Erwin Eugen Johannes (1891-1944). German soldier. He was born at Heidenheim, Nov. 15, 1891, and studied at Württemberg royal academy and Tübingen university. Entering the army in 1910, he served throughout the First Great War, winning distinction at Caporetto. He was at Hitler's h.q. during the German invasions of Austria,



E. E. J. Rommel,
German soldier

1938, Czecho-Slovakia and Poland, 1939; and at the head of a Panzer div. in France, 1940, took St. Valéry-en-Caux. In Libya in command of the German Afrika corps, he established a reputation as a bold and skilful leader, nearly destroying the British 8th army in 1942 before he was defeated at Alamein and driven into Tunisia. In 1943 he was given a command in Italy, and in May, 1944, was transferred to France. He was wounded on July 17, when his car was attacked by an Allied aircraft; and on Oct. 15, 1944, his death from wounds was announced. Hans Speidel, Rommel's chief-of-staff in Normandy, stated however, in *Invasion*, 1944 (Eng. trans. 1950), that Rommel was involved in the July Plot (q.v.), and was murdered at Hitler's orders. According to other accounts, he committed suicide.

Romney. Mun. borough of Kent, England, one of the Cinque Ports. It is 75 m. S.E. of London and 8 m. S.W. of Hythe, with a station on British rlys. (S. region). The chief buildings are the church of St. Nicholas, mainly Norman, and the town hall containing a collection of documents relating to the Cinque Ports. In the Middle Ages Romney was the chief of these ports and a corporate town governed by jurats. In the 13th and 14th centuries the encroachments of the sea destroyed its fine harbour, and it is now about a mile from the coast. Littlestone-on-Sea is part of the borough, called New Romney to distinguish it from Old Romney, a village 2 m. W. Pop. 2,100.

Romney Marsh, to the N., reclaimed in Roman times, is used extensively for sheep-grazing.

Romney, Earl of. British title borne since 1801 by the family of Marsham. Sir John Marsham (1602-85), who belonged to an old Kentish family, was a clerk in the court of chancery. He became an M.P., and in 1663 a baronet. His descendant, Sir Robert (1685-1724), 5th baronet, governor of Dover Castle and M.P. for Maidstone, was made a baron in 1716. His grandson Charles (1744-1811), 3rd baron, also an M.P. before succeeding to the title, was made earl of Romney in 1801. In 1933 Charles Marsham (b. July 9, 1892) became 6th earl. The earl's son is called Viscount Marsham.

There had been an earlier earl of Romney, Henry Sidney (1641-1704), a son of Robert Sidney, 2nd earl of Leicester. He was a courtier in the time of Charles II, who

sent him to represent him at The Hague. Afterwards he supported William of Orange, and was made a baron in 1689. Under William he was a secretary of state, lord-lieutenant of Ireland, and master-general of the ordnance. Created earl of Romney in 1694, he died unmarried, April 8, 1704.

Romney, George (1734-1802). British painter. Born at Dalton-in-Furness, Dec. 15, 1734, he had a scanty education, and for a time worked with his father, a cabinet-maker, studying drawing in spare moments. Apprenticed to Edward Steele, a portrait painter, in 1755, he worked at various places in the north, and in 1762 settled in London. His first pictures of note were *The Death of Wolfe*, 1763, purchased for the council chamber



George Romney, British painter
From a self-portrait in the National
Portrait Gallery, London

at Calcutta, and *The Death of King Edward*, 1765 (first prize at the Society of Arts). In 1764 he stayed for a short time in Paris. Slowly building up a connexion as a portrait and subject painter, he prospered sufficiently to visit Italy, 1772-74, where he made copies of many famous pictures, including Raphael's Transfiguration, the altar-piece at Montorio.

On his return he became fashionable and a rival of Reynolds, painting, among others, the duke of Richmond, then president of the Society of Arts, Lady Warwick and her Children, "Perdita" Robinson, and Lady Russell and Child. From 1782 most of his attention was devoted to Lady Hamilton, of whom he painted about 30 character portraits. After her departure for Naples he turned out a great quantity of work until 1789, when ill-health caused him to retire. He resided for a time at Hampstead, but in 1799 bought an

estate at Ulverston, where on Nov. 15, 1802, he died. Except at sales, no work by Romney was exhibited between 1772 and 1817, and most of his canvases are in private hands, except those at the National and National Portrait Galleries. He is generally ranked below Reynolds and Gainsborough, but scores over them in simplicity. *See* Cravon, Lady; Cumberland, R.; Jordan, D.; Newdigate, Sir B.; Paine, T.

Bibliography. Lives, W. Hayley, 1809; H. E. Maxwell, 1902; G. R. and His Art, H. Gamlin, 1894; Romney, H. Ward and W. Roberts, 1904; B. L. K. Henderson, 1922.

Romney, Hythe, and Dymchurch Railway. Miniature rly. in Kent, England. The smallest public rly. in the world, built to a gauge of 15 ins., it runs 13 m. from Hythe to Dungeness lighthouse. Its construction was begun in 1926, and on Aug. 5 that year the duke of York (King George VI) drove the engine of a trial train. The stretch from Hythe to New Romney was opened to the public in 1927, and extended to Dungeness the following year. During the Second Great War the line was requisitioned, first by the army for a mobile A.A. unit, and later by the ministry of Supply for Operation Pluto. It was reopened to the public by the film stars Laurel and Hardy in 1947.

Romney Marsh. Extensive level tract of rich pasture land in Kent, England. It is protected against the encroachment of the sea by an earthen embankment stretching from New Romney to Hythe. Managed by a corporation, it contains several villages.



Romsdal, Norway. Valley of the Rauma, looking towards Stuefjoten

Romø. Danish island in the N. Sea. One of the N. Frisian group, off the coast of Slesvig, it is 9½ m. from N. to S., and 3 m. from E. to W. Kongsmark and Kirkeby villages are on the E. shore, and Lakolk, a sea-bathing resort, on the W. Pop. est. 1,000.

Romola. Historical romance by George Eliot. First published serially in *The Cornhill Magazine*, July, 1862-Aug., 1863, it was issued in book form in the latter year. The scene is laid in Florence at the end of the 15th century, and in the book is introduced the story of Savonarola's career



Romsey, Hampshire. Market Square, with statue of Lord Palmerston. Top, right, abbey church of S. Mary, from the south-east

Frith & Valentine

and martyrdom. It is a very close and detailed account of Florentine history. The title is taken from the name of the heroine.

Romorantin. Town of France. In the dept. of Loir-et-Cher, it stands at the confluence of the Sauldre and the Morantin, 37 m. N.W. of Bourges. There are cloth and cotton factories and oil refineries. Romorantin was formerly the capital of Sologne and belonged to the counts de Blois in the 12th century. It was captured by the Black Prince in 1356. In the 15th century it passed to the dukes of Orléans, and later to the dukes of Angoulême. The celebrated edict of Romorantin in 1560 prevented the establishment of the Inquisition in France.

Romsdal. Valley of the Rauma, central Norway. It runs S.E. from the S. arm of the Romsdal Fjord, and is dominated by the Romsdalshorn, 5,095 ft., and the Trolltinder (witch needles), some 6,000 ft. high. Aandsnes, at the head of the fjord, is the terminus of the

road up the valley and across the plateau to the Gudbrandsdal, wherein is the trunk rly. from Oslo to Trondhjem. In the valley are wild reindeer. Cod and herring fishing is carried on. The name Romsdal is also that of an island at the mouth of the fjord.

Romsey. Mun. borough and

market town of Hants, England. It stands on the Test, 10 m. N. of Southampton, with a rly. junction. The chief building is the beautiful church, originally that of a Benedictine nunnery, founded in 907, and around which the town grew. Dedicated to S. Mary, its proportions resemble those of a cathedral; it is almost entirely Norman in style, and is regarded as perhaps the finest building of its kind in the country. It was bought by the parishioners from Henry VIII for £100. There are an agricultural trade, manufactures of paper and leather, and the growing of willows for cricket bats. Romsey became a chartered town in 1607, and was a centre of the woollen trade. Near is Broadlands, once the seat of Lord Palmerston, now the seat of Earl Mountbatten. Market day, Thurs. Pop. 6,500.

Romulian Calendar. Division of the Roman year, traditionally ascribed to Romulus, and divided into ten months only, comprising in all 304 days. In the reign of Numa two more months were added. *See* Calendar. *Consult* The Calendar, A. Philip, 1921.

Romulus. In ancient Roman legend, the founder of the city of Rome. He was represented as a son of Mars by Rhea Silvia, daughter of Numitor, son of the last king of Alba Longa. Numitor's brother Amulius had made Rhea a vestal

virgin vowed to perpetual chastity, so that she should have no children to claim the throne which he had seized. When her twin sons Romulus and Remus were born, mother and children were cast into the river by order of Amulius. The children in their cradle drifted ashore and were suckled by a she-wolf. Discovered by a shepherd, the boys were brought up by him, and on reaching manhood slew the usurper Amulius and reinstated their mother's father Numitor.

They then proceeded to found a city on the Palatine Hill, and when the walls were built Remus leapt over the walls to show his contempt for them. This so enraged Romulus that he killed his brother. A motley crowd gathered round him in the new city, and in order to provide his people with wives Romulus invited the Sabines to



Romulus, legendary founder of Rome
From a coin

join them in sacred games, during the progress of which the Sabine women were seized by the Romans. This led to a war with the Sabines, which was ended by the interposi-

tion of the women who had been seized, and the Romans and the Sabines agreed to unite and become one nation.

Romulus was king, first with the Sabine Titus Tatius as colleague, and latterly alone. He was taken up to heaven in a fiery chariot by his father Mars, and thereafter worshipped by the Romans as a god under the name Quirinus. See Quirites; Rome.

Romulus Augustulus. Last Roman emperor of the West, A.D. 476. See Augustus.

Ronald, Sir Landon (1873-1938). British conductor and composer. Son of Henry Russell, composer of *A Life on the Ocean Wave*, and other popular songs, he was born June 7, 1873, and educated at the Royal College of Music. A fine pianist, he played the accompaniment to the wordless play *L'Enfant Prodigue* at the Prince of Wales's Theatre, London, 1891, and was later Melba's accompanist. As a con-



Sir L. Ronald,
British musician

ductor he directed the Royal Albert Hall orchestra in 1908, and instituted successful concerts at Birmingham and elsewhere, becoming well known for his conducting of Elgar's symphonies. He was principal of the Guildhall School of Music during 1910-37. His compositions included incidental music for stage productions, e.g. *The Garden of Allah*, 1920, and over 200 songs, the best known of which was *Down in the Forest*. He was knighted in 1922. His reminiscences *Variations on a Personal Theme* appeared in 1924, and *Myself and Others* in 1931. He died Aug. 14, 1938.

Ronald Megaw Prize. Naval prize. It was founded in 1906 in memory of Midshipman Ronald Megaw, who was killed accidentally aboard H.M.S. Montagu, Nov. 11, 1904. From the interest upon a sum of £1,000 a presentation sword, books, etc., are given annually to the sub-lieutenant who obtains the highest place during the preceding year in the various examinations for promotion.

Ronalds, Sir Francis (1788-1873). British scientist. Born Feb. 21, 1788, and educated



Sir Francis Ronalds,
British scientist

privately, he made a study of electricity. In 1816 he made the first experimental electric telegraph, laying down eight miles of wire at Hammersmith, and transmitting signals by means of synchronised rotating disks. His invention was rejected by the Admiralty, and after publishing details of it in 1823, Ronalds took no further interest in it. In 1843 he was made director of the Meteorological Observatory at Kew, and while there he invented photographic self-recording instruments, which began to be used in 1845. This invention was of great practical importance in all work connected with automatic registration for scientific purposes. His invention of the telegraph was developed by Wheatstone and others, the former of whom acknowledged the debt he owed Ronalds. Knighted in 1871 in recognition of his work as a pioneer in the electric telegraph, Ronalds died Aug. 8, 1873.

Ronaldshay. Two islands of the Orkneys, Scotland. North Ronaldshay, the most northerly of the islands, is 3 m. long and 2 m. broad, and the surface is

mainly low and flat. At Burrian are the ruins of a castle. The North Ronaldshay Firth, which separates it from Sanday, is dangerous to navigation. Pop. est. 400.

South Ronaldshay is the most southerly of the Orkney Islands. It is 8 m. long and 4 m. broad, with a low, level surface, and is well cultivated. The island has two old churches and remains of several Picts' Houses. Pop. est. 2,000. The title of earl of Ronaldshay is borne by the eldest son of the marquess of Zetland. One holder of the title earl of Ronaldshay, Lawrence John Lumley Dundas (b. 1876), was M.P. for Hornsey 1907-16, and governor of Bengal 1917-22. The details of his life are given under his later title of Zetland, Marquess of.

Roncesvalles (Fr. *Roncevaux*). Village of Spain, in the prov. of Navarre. It lies, at an altitude of 3,220 ft., in the Pyrenees, 5 m. S. of the French frontier and 21 m. N.E. of Pampeluna. It is famous as the scene of the defeat of the rearguard of Charlemagne and the death of Roland and the 12 peers. There is a remarkable 13th century pilgrimage church containing relics of the paladin Roland. The library of the monastic house here has many valuable documents.

Ronda. Town of Spain, in the prov. of Malaga. It stands on the Guadalevin river, 43 m. W. of Malaga and 44 m. by rly. S.W. of Bobadilla on the Algeiras Rly. It is placed on both sides of a deep, rocky gorge, surrounded by mts. at an alt. of 2,460 ft. The river is spanned by three bridges. Ronda was the capital of a small Moorish kingdom until 1485, when it was



Ronda, Spain. Bridge over the rocky gorge of the Guadalevin

taken by the army of Ferdinand V. The old town was built by the Moors; the new one was founded by the Catholic kings after the siege of 1485. Besides some Roman and Moorish relics, Ronda has one of the largest and finest bull-rings in Spain. It has a considerable trade in leather, horses, wine, and hats. Pop. 32,600.

Rondeau. Development of the early French native songs made for the accompaniment of dancing or household work. It was inaugurated by Guillaume de Machault (1295-1377), and elaborated by the French lyrical poets who followed him. The recurring refrain is its characteristic feature. The rondeau consists of three parts, the first of five lines, the second of three, and the third of five, with the first word, or the first half, of the first line repeated at the end of the second or third parts. The lines are generally octosyllabic and there are but two rhymes. The formula is: aabba; aab, refrain; aabba, refrain. *See Poetry; Rhyme.*

Rondebosch. Suburb of Cape Town, S. Africa. It is 5 m. to the S. of the city proper and is a residential area. Here is Groote Schuur (*q.v.*). *See Cape Town.*

Rondel. Verse form. Like the rondeau, it originated in the native French dance-song, and is distinguished by the recurring refrain. It consists of three groups of lines, usually octosyllabic, with but two rhymes. The first group has four lines; the second has four, the last two of which are the first two of the first group; and the third group has six lines, the last two being the first two of the first group. The formula is: ABba, abAB, abbaAB (*see Rhyme*), the capital letters representing the lines which are repeated. The rondel was largely superseded by the rondeau. Andrew Lang and Austin Dobson are successful exponents of it, as of many other old French verse forms. *See Poetry; Verse.*

Rondo. Form of musical composition. In it the principal subject occurs not less than three times and always in the tonic key. Rondos are of two kinds: "old," in which the appearances of the subject are separated by episodes in related keys; "modern," in which the place of the first and third episodes is taken by a second subject treated according to the rules of Sonata form (*q.v.*). The second episode may be retained, or instead of it there may be a development section. The term is

sometimes given, loosely, to light and gay movements.

Rønne. Seaport of Denmark, capital of the island of Bornholm (*q.v.*). It stands on the W. coast, and is connected by cable with Møn in Zealand, and by rly. with Naxø on the E. coast. It has an artificially deepened harbour and shipbuilding yards, and manufactures pottery from the local kaolin. Pop. est. 10,000.

Ronsard, PIERRE DE (1524-85). French poet. He was born at La Poissonnière, Vendôme, Sept. 11, 1524, the son of a court official of Francis I. Pierre passed a little time at the college of Navarre, in Paris, before he became a page at court. He went to

Scotland in the retinue of Mary of Guise, 1538, remaining in the British Isles for three years. After returning to France he lived in court circles, but devoted much of his time to poetry. Successive kings patronised him, and he was on friendly terms with Elizabeth of England, Mary Queen of Scots, and other royal ladies. About 1572, however, he retired to the country, and on Dec. 27, 1585, he died at Tours.

About 1549 Ronsard became leader of the *Pléiade* (*q.v.*), the object of which, as set forth in Du Bellay's *Deffense et Illustration de la Langue Françoisse*, was to enrich the language of literature and to revolutionise French poetry by the imitation of the masterpieces of classical antiquity. In accordance with this programme, Ronsard wrote *Hymnes* on the Homeric model, *Pindario odes*, and an unfinished epic, *La Franciade*. These experiments, however, have only an historical interest. His real qualities as a poet must be sought in his sonnets and minor lyrics. Unduly depreciated by the classical school, his poetic reputation was championed by the Romantics. *Consult Works*, with notes, by P. Blanchemain, 1857-87; *Songs and Sonnets of Pierre de Ronsard*, C. H. Page, 1903; *Ronsard and the Pléiade*, George Wyndham, 1906; *Ronsard Lyrics*, trans. W. Stirling, 1946; *Ronsard*, D. B. Wyndham Lewis, 1946.

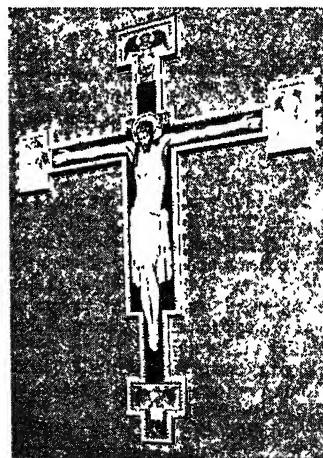
Röntgen, WILHELM KONRAD (1845-1923). German physicist. Born at Lennep, in the Prussian Rhine prov., March 27, 1845,

and educated at Zürich university, he became professor successively at Hohenheim, 1875; Strasbourg, 1876; Giessen, 1879; and Würzburg, 1885. In Nov., 1895, he announced the discovery of the rays which for long bore his name, in 1899 he was appointed professor of experimental physics at Munich, and in 1901 he received the Nobel prize for physics for his discovery of the Röntgen or X-rays. He wrote numerous scientific papers on them, as well as on other branches of physics, and carried out valuable research work on the conductivity of heat of crystals, magnetic rotation of polarised light, absorption of heat of gases, etc. He died Feb. 10, 1923. *See X-Rays. Pron. Runtghen.*



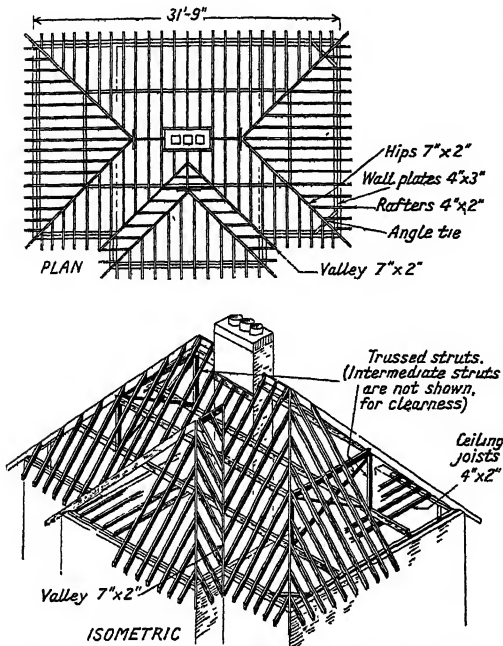
W. K. Röntgen,
German physicist

Rood (A.S. *rōd*, cross). Old name for a cross or crucifix. It is specially used for the great crucifix



Rood. Cross above chancel rail in
Westminster Cathedral, London

which in English churches, from the 14th century to the reign of Elizabeth, generally stood on the rood-screen dividing the chancel from the nave. At the foot were often figures of the Virgin and S. John the Evangelist. In some churches a gallery, from which parts of the service were recited, ran along the top of the screen. This was called the rood-loft or jubé; and a staircase in the masonry of one of the piers, called the rood-stairs, still seen in many churches, gave access to it. Modern



Roof. The structural details of a hipped roof on a domestic building shown in isometric drawing, and in plan (top) with sectional dimensions of the principal members. The design is by Edgar Lucas, A.I.A.A.

roods occasionally replace those destroyed at the Reformation. See Doom; Holyrood.

Roof. Unit of land or superficial measure, equal to one-fourth of an acre. It is divided into 40 rods, or 1,210 sq. yds. The name is cognate with rod, and probably originally denoted the wand first used in measuring land.

Roodepoort. Town of S. Africa, in the Transvaal. It is situated on the rly. 25 m. N.W. of Johannesburg and, as a centre of the Witwatersrand goldfields, had considerable prosperity following S. Africa's departure from the gold standard at the end of 1932. During the 1930s its population showed a great rise, and it is now 17th among the towns of the union. Pop. 41,572.

Roof. Top covering of a building to give protection from weather. A roof has two distinct parts: the structure, and the covering. The structure supports the dead load of the roof and also loads caused by weather, e.g. snow. The roof is supported either on the walls or on a structural frame. The traditional roof shapes were determined largely by local rainfall. In countries with low rainfall roofs are either flat or of low pitch. In northern countries, where the

rainfall is high, roofs are usually pitched at angles of 30 to 60 degrees. Modern roof shapes are determined largely by the type of roof and framing. As flat roofs can be covered with water-tight materials they are now used irrespective of rainfall. A flat roof is more convenient on a plan of irregular shape.

PITCHED ROOFS. A pitched roof has a slope of more than 10 degrees, and a very low pitch is adequate for impervious sheet materials. But pitched roofs are usually covered with overlapping units. These include tiles of clay, concrete, and asbestos-cement; slates both natural and of asbestos-cement; wood shingles; thatch; and sheets of asbestos-cement, iron, steel, and aluminium. For these materials pitches vary from 22 to 50 degrees. A sub-roofing is often added to increase weather resistance and insulation. Bituminous felt may be laid under clay tiling as a positive stop against rain, dust, and draught, which otherwise might penetrate. Fibreboard may be fixed to improve thermal insulation. Roof trusses or principals are frames fixed at intervals to support the roof members. In traditional roofs the timber trusses sometimes form fine architectural features, as in Westminster hall. In modern roofs trusses are usually of steel or reinforced concrete, or of wood in a lattice form of construction. In steelwork welding is widely used.

FLAT ROOFS. The roof structure may be of wood or steel joists supporting boarding or a concrete slab, or of pre-cast units. The covering may be a material without joints, such as asphalt; a material with sealed joints, such as felt; or a sheet material with lapped joints, such as lead. A flat roof has a slight fall for drainage.

GLAZED ROOFS. These are of two kinds: pitched, with sheets of glass set in glazing bars, and flat with blocks of glass set in frames of steel or pre-cast reinforced concrete. Lantern lights may also be used on flat roofs. Where it is desired to exclude direct sunlight a north-light roof is used. This has a steep glazed side facing approximately N. See Architecture; Building; Mansard.

Rook (*Corvus frugilegus*). Common bird of the crow family. The plumage is black with purple reflections, and the length of the bird is 18 in. s. It is readily distinguished from the crow by the bare whitish patch of skin surrounding the base of the beak. It is common in Great Britain, and nests in large colonies in the tops of high trees, near houses.



Rook. Gregarious bird of the crow family

W S Berridge, F.Z.S.

About March the old nests, which are made of sticks and lined with grass, are repaired or new ones built. Five or six eggs are laid, bluish green in colour and spotted with brown and purple. The male often shares the duty of incubation with the female. Out of the breeding season the rookery is usually deserted. Rooks are gregarious, and fly morning and evening to their feeding grounds, for grubs and insects. See Eggs colour plate.

Rook or CASTLE. Piece in chess. Each player has two rooks, which start in the corner squares and may move any number of squares in a straight line vertically or horizontally. Either rook may combine with the king once in a game in a special move known as castling. See Chess illus. p. 1996.

Rooke, SIR GEORGE (1650-1709). English sailor, born near Canterbury. Going to sea as a lad,



Sir George Rooke, English sailor

he saw much service against the Dutch and was promoted rear-admiral in 1690. The victory of Barfleur, 1692, was practically due to Rooke's gallantry and seamanship, and he was knighted in 1693. Lord commissioner of the Admiralty in 1694, he became commander-in-chief of

the Mediterranean fleet in the following year, and in 1697 of the Channel fleet. On the outbreak of the war with France, 1702, Rooke sailed with 14,000 men under the duke of Ormonde, and by a brilliant and daring attack seized Vigo and totally destroyed the Franco-Spanish fleet anchored there. In 1704 he assisted in the capture of Gibraltar, July 21, and fought an indecisive battle off Malaga. He died Jan. 24, 1709.

Roon, ALBRECHT THEODOR EMIL, COUNT VON (1803-79). German soldier. Born April 30, 1803,



Count von Roon,
German soldier

at Pleushagen, near Kolberg, the son of an officer, he entered the Prussian army in 1821. He made a reputation as a writer by works on military geography, while he taught cadets, lectured, served on the general staff, and acted as tutor to Prince Frederick Charles. In 1848 he saw a little actual warfare, and with the support of King William I began the work of reforming the army. Minister of war 1859, and of marine 1861, he held both posts until 1871, and the fruit of his labours was seen in the wars against Austria and France. In the former war he commanded a division. In 1871 he was made a count and in 1873 a field marshal. He died Feb. 23, 1879. His memoirs were edited by his son, 1892, who also wrote his Life.

Roorkee or **RURKI**. Town of the Uttar union, India, in Saharanpur dist. It is situated in the E. of the dist. and has rly. connexions with Dehra, Saharanpur, and Najibabad. Thomason civil engineering college is the most noted of this type of educational institution in India; the town is the headquarters of the Ganges Canal administration, and contains the canal workshops. It was a mud village before the canal was constructed. Pop. 18,600.

Roosebeke. Village of Belgium, near Courtrai, W. Flanders prov. In battle here, Nov. 27, 1382, the French under Charles VI, defeated with vast slaughter the Flemish burghers under Philip van Artevelde (q.v.).

Roosevelt, (ANNA) ELEANOR (b. 1884). American politician, sociologist, and writer. Daughter of Elliott Roosevelt and niece of President Theodore Roosevelt, she was born in New York, Oct. 11,

1884, and educated privately. She married F. D. Roosevelt (q.v.), a distant cousin, in 1905. After he



Eleanor Roosevelt,
American politician

became president in 1932, she achieved prominence as public speaker and writer. She was hostess to King George VI and Queen Elizabeth during their visit to the U.S.A. in 1939. Her column, My Day, syndicated among some 90 newspapers, was widely read; while her strong, sympathetic personality and her eloquence as a speaker made her a popular figure. She was on the U.S. delegation to the first United Nations

assembly which met in London, Jan.-Feb., 1946, when her column appeared temporarily in the Evening News. At the assembly's second meeting, in New York, she was nominated, Dec., 1946, to the commission on human rights of the U.N. economic and social council. Under her chairmanship from its first meeting, Jan., 1947, this commission drew up and adopted June 18, 1948, a declaration setting up a common standard of human rights. She stayed with the king and queen when she came to London to unveil the memorial to her husband in Grosvenor Square, April 12, 1948. She wrote the autobiographical *This Is My Story*, 1937; *If You Ask Me*, 1948; *This I Remember*, 1949; and edited *Letters of Elliott Roosevelt*, 1932.

F. D. ROOSEVELT, 31ST U.S. PRESIDENT

D. W. Brogan, author of *The American Political System*, etc

This life of one of the most important presidents of the U.S.A. is supplemented by articles on his wife (Anna) Eleanor Roosevelt and his political associates and opponents, e.g. Dewey, T. E.; Hopkins, H. L.; Hull, Cordell; Perkins, Frances; Smith, A. E.; Wallace, H. A.; Wilkie, W. See also Lease-Lend; New Deal; Tennessee Valley Authority; United States of America: History, etc.

Franklin Delano Roosevelt was born Jan. 30, 1882, the only child of James Roosevelt by his second wife, Sarah Delano. On both sides he belonged to distinguished and wealthy American families, though neither the Roosevelts nor the Delanos were multimillionaires. He grew up on the family estate, Hyde Park, on the Hudson, was sent to Groton, a new and fashionable imitation of the great English public schools, and, in due course, to Harvard. Lively and intelligent as well as handsome and physically strong, young Roosevelt was more prominent in college politics and journalism than in his studies or in formal college sports. His boyish ambition had been to enter the navy, he was from boyhood a daring and skilful yachtsman.

After graduating, Roosevelt entered the law school of Columbia university in New York city and was admitted to the bar. More important, he married his remote cousin, Eleanor Roosevelt, niece of the president of the U.S.A. His ambition turned to politics. The long eclipse of the Democratic party, to which his branch of the family was attached, was ending; nevertheless, his remarkable feat in winning a seat in 1910 in the state senate in a "rock-ribbed" Republican district attracted attention to the young political aspirant, who had a famous

name, good looks, and ability. Interest was increased by his taking the lead in a successful campaign in the legislature against the Tammany Hall leadership of the Democratic party.

A Supporter of Wilson

As the presidential election of 1912 approached, Roosevelt became a leading supporter of the claims of the governor of New Jersey, Woodrow Wilson. 1912 saw the triumph both of Roosevelt's party and of his candidate. Wilson rewarded his young supporter by the post of assistant-secretary of the navy—the post which had been the gateway of political opportunity for his uncle-in-law, President Theodore Roosevelt. Young Roosevelt's defeat, in 1914, in a campaign for the Democratic senatorial nomination from New York was a blessing in disguise. The Roosevelt household was one of the most active political centres of the younger set in Washington, and Mrs. Roosevelt made an important contribution to her husband's political education and progress by keeping in constant touch with such leaders of the movement for social reform as Frances Perkins. With American entry into the First Great War, in 1917, Roosevelt's post became of great importance, and he discovered how long it takes to turn a peace economy into an effective fighting

machine; he also learned that it can be done.

Roosevelt received, in 1920, the high honour (for so young a man) of the nomination for vice-president. The Democratic ticket was overwhelmingly defeated, and Roosevelt went into business, not very successfully. In 1921 he was stricken with infantile paralysis, and for a long time seemed doomed to be a helpless cripple. In the slow and at times desperate climb back to health, Roosevelt learned a great deal; in particular patience and understanding. A devoted secretary, Louis Howe, collaborated with his wife in saving the crippled man from accepting relegation to the rôle of spectator. Although till his death Roosevelt was terribly crippled, forced to wear an elaborate harness and to be dependent on a stick and on the arms of attendants for his limited power of movement, his general health was completely restored.

In 1924 he again attracted public attention by a brilliant speech nominating "Al" Smith for the presidency, and in 1928 he was spokesman for the same politician, whom he had called "the happy warrior." His friendship for Smith led him to consent to run for governor of New York state, since his candidacy would help the presidential candidate. Smith was defeated, and while he had not carried even New York, Roosevelt was elected governor. From that moment Roosevelt was among the obvious favourites for the Democratic nomination in 1932, and, when he was re-elected governor in 1930 by a larger majority than had ever been secured before, he was automatically first favourite.

He secured the nomination and, defying all precedent, flew to the convention to accept it on the spot, then set out on a speaking campaign that was an occasion both for developing a programme and, more important still, for proving his physical fitness for the exacting office to which he was asking to be elected. By the autumn of 1932 the world economic crisis was at its height. In electing Roosevelt the American people voted less for something than against something. The four months' interval which then elapsed between election of a new president and his inauguration was marked by deepening economic crisis in which the president-elect several times conferred with the defeated president-in-

office, but refused to accept any responsibility for joint action. His ideas on how to deal with the crisis were, in temper if not in detail, poles apart from those of Hoover. Roosevelt had promised the American people "a new deal," and he meant it. It was by a narrow chance, however, that the president-elect survived to take office, for while on holiday in Florida in Jan., 1933, he was shot at by a crazy fanatic, and the mayor of Chicago, who was beside him, was mortally wounded.

By March, 1933, the crisis was threatening all American economic life. In state after state, banks



Franklin D. Roosevelt

shut down; and the new president, as his first act, closed all the banks in the U.S.A. There were millions of unemployed, private and public bankruptcy, and the demoralisation caused by more than three years of increasing misery. "But," said Roosevelt, "the only thing we have to fear is fear itself," and within a few days the nation was stimulated to hope by its new chief's energy.

His administration had a short-term and a long-term task: to stop the rot and to try to remove its causes. Public confidence was rapidly restored; most banks reopened and the economic paralysis passed. Then began the "first new deal," of which the most publicised feature was the national recovery administration (NRA). This was a scheme of voluntary cooperation among businessmen not to cut prices or indulge in "unfair competition." Labour was supposed to gain union recognition and better wages and conditions. Acceptance of the NRA was a patriotic duty; but within a year it was becoming plain that American

business was not yet ready for self-regulation and that most of labour's gains were illusory. The agricultural adjustment administration (AAA), which paid farmers to cut down production of unmarketable crops, was better planned. The insurance of bank deposits below a certain figure bred confidence, as did the beginnings of effective regulation of the stock exchanges. The departure of the U.S.A. from the gold standard, although it torpedoed the world economic conference that was meeting in London, showed Americans that the president was indifferent to the judgement of orthodox financiers—at that moment the most unpopular class in the U.S.A. Within a few months the new president was overwhelmingly the most discussed, admired, or suspected figure in the Union. The old political leaders were eclipsed, and the newcomers, members of his "brain trust," were mere lieutenants of their chief, not great public figures in their own right. The mid-term congressional elections of 1934 ratified the president's policies and were a plebiscite on his personality; the Democrats made further gains in both houses.

Despite this victory, the honeymoon period of the new deal was over. Criticism centred chiefly on the lavish expenditure of the federal government, in contrast with the promises of retrenchment made in the Democratic platform of 1932. The economies the new administration had carried through were overshadowed by the grants for federal aid to the unemployed and especially by the programme of public works. This was launched under NRA but survived that experiment. It fell into two main classes: the long term, carefully planned, and slowly executed schemes of public works administered by the secretary of the interior, Ickes, head of the public works administration (PWA), and the short-term, empirical, improvised schemes of the works progress administration (WPA) under Harry Hopkins. It was especially WPA that was attacked. Its efforts to find work for the unemployed, actors as well as manual labourers, writers as well as dockers, were described by critics as "boomdogging" and criticised as the creation of a vast political machine of federal beneficiaries as well as a means of destroying the autonomy of the states. In defence it was not only

asserted that the human values preserved by work, even by "made work," were greater than the mere financial computation could show, but that the federal govt. was "priming the pump" by putting purchasing power into the hands of the poorest, a simplified version of Keynes's economic theories. The critics were not mollified; and only the civil conservation corps (CCC) that enrolled hundreds of thousands of young men in camps to restore forests, improve waste land, etc., was virtually exempt from criticism. The election of 1936 was, however, the most one-sided contest in U.S. history. Governor Landon of Kansas carried only the two small New England states of Maine and Vermont, and no previous election in American history had been fought on such an open class basis.

Effects of 1936 Election

So great a victory had two dramatic results. The first was the outbreak of a series of "sit-down" strikes in the great automobile plants. They arose from the anger of the workers at the effective nullification of the right to organize independent unions formally guaranteed by NRA. The Roosevelt administration verbally deplored illegality; but the Democratic governor of Michigan, Frank Murphy, took no steps to eject the strikers, and his inertia (or prudence) was violently attacked and the administration blamed.

Still more anger and apprehension were caused by the president's "court plan." In a series of decisions, the supreme court had invalidated most important new deal statutes and had also seriously limited the power of the states to pass effective social legislation. Both political parties were in a dilemma: for, if the court had its way, there would be great areas of American life for which neither the federal nor the state govts. could legislate. The remedy of a constitutional amendment was slow and uncertain, and in secret the president chose to alter the composition of the court, or, as it was said, to pack it. For every judge over 70 who did not retire, the president could, in the bill brought forward, add a judge to a maximum of six. This was a bold, even reckless attack on the most sacred of American institutions. It might have succeeded but for the change in the court itself. One justice changed sides and several very

important new deal laws were saved. The necessity of carrying through so drastic an innovation was no longer obvious, and the president suffered his first defeat. It was not his last. A bill for the reorganization of the civil service was defeated by a campaign against "dictatorship"; and a sharp decline in economic activity in the late summer of 1937 showed that the administration had not solved the economic problems of American society. In face of the "recession," Roosevelt turned to the left, gave up the new policy of reducing expenditure, and asked for a great expansion of WPA, which congress granted. The mid-term elections of 1938 showed a marked turning away from the Democratic party. To some Democratic politicians the lesson was plain: the president must be induced to break the most sacred of American taboos and run for a third term.

But by the end of 1938 attention was moving away from internal affairs. The Roosevelt administration in its first year or two had been comparatively indifferent to diplomatic problems. The absurdity of not recognizing the Soviet govt. was ended in 1933, and the policy of the good neighbour was applied in Latin America by the abrogation of all American limitations on the sovereignty of Cuba, Panama, Haiti. The secretary of state, Cordell Hull, was even more interested in lowering trade barriers, and his Trade Agreements Act (1936) made progress in that sphere possible and, in some cases, real. But the temper of the American people was violently isolationist. This was revealed in the two Neutrality Acts of 1935 and 1937, by the refusal to grow indignant over the Japanese attack on the gunboat Panay in 1937, by the proposed "Ludlow amendment" that would have made it impossible to declare war until after a plebiscite, and by the hostile reception given to the president's trial balloon when in 1937 he suggested putting aggressive nations "into quarantine."

Preparation for War

Roosevelt's determination to build up the navy, especially after Japan refused to continue the limitations of the Washington naval treaties, was regarded as a more or less harmless eccentricity. The Munich crisis ended all that; rearmament was now undertaken with general approval but on a very inadequate scale. As the European crisis grew worse, the president tried in vain to secure

repeal of the Neutrality Acts; these, in effect, worked to help Germany, which would in any case be blockaded.

The outbreak of war revealed how hostile the American people was to Hitler's Germany—and how determined to stay out of the war. After two months of heated debate, the neutrality legislation was amended to allow purchases of war materials on a cash-and-carry basis. But equally significant was the American policy of barring all belligerent ships from the seas around both American continents, a pious opinion which did not prevent British and German warships from fighting inside what was ironically christened "the chastity belt." The invasion of Norway, then of the Low Countries, and the defeat of France ended what the Americans called the "phony war," and immensely increased the prestige of the president. It made inevitable, too, his nomination for a third term. He had shown his sense of crisis by inviting two eminent Republicans to head the service departments—Col. Henry Stimson the war and Col. Frank Knox the navy department.

Henceforward the main interest of the president's life was defence, and then war. But, scarcely noticed by the public, most of the original new deal had been reenacted and validated by the supreme court, now by the passage of time full of Roosevelt appointees. The Wagner Act effectively guaranteed trade union rights; minimum wage laws, the outlawing of child labour, the constitutionality of that great experiment in integrated economic and social reconstruction the Tennessee Valley Authority, the vast extension of federal aid to housing and child welfare, the establishment of a system of unemployment insurance were all given sanction by the new court. And the continuing left temper of the administration was underlined by the choice of Henry Wallace, the secretary of agriculture, as vice-presidential candidate.

The election of 1940 was much closer than that of 1936, but Roosevelt's policy was ratified—and supported by the Republican candidate, Wendell Willkie. By a bold interpretation of his powers, Roosevelt had in the summer of 1940 transferred great quantities of weapons to the U.K.; then, in exchange for bases in British possessions, he transferred 50 "over-age" destroyers and, once re-elected, produced the even

bolder scheme of lease-lend as the most effective means of "all aid to Britain short of war." With the German invasion of Russia, the Soviet Union qualified for lease-lend. There were incidents—the sinking of U.S. ships, the orders given to the navy to "shoot at sight"; and war between the U.S.A. and Germany came closer. In Aug., 1941, Roosevelt met Churchill for the first time, off the American coast. They drafted and issued the document called the Atlantic Charter; but Roosevelt evaded any promise of active belligerent aid. Then the rulers of Japan launched their surprise attack on the Pacific fleet at Pearl Harbour (Dec. 7, 1941), Germany and Italy declared war on the U.S.A., Roosevelt's period of waiting and manoeuvring was over.

Pearl Harbour united the American people; but at first there was only a series of disasters to report. Preparations for building an immense army, navy, and air force were put in hand; the Japanese threat to Australia was parried, and the policy of the grand alliance with Great Britain and Russia was worked out. The invasion of N. Africa was planned, and took place a week after the mid-term elections of 1942 had shown a violent reaction against the administration's conduct of the war, especially on the home front. But though the American voters did not know it, the tide had turned.

The president concentrated more and more on waging war. He chose the generals and admirals, decided the main issues of grand strategy in consultation with Churchill at Washington, Quebec, Casablanca, and, with Stalin added, at Teheran. The general economic problems of the home front he entrusted to a close friend, James Byrnes, who left the supreme court. Italy was invaded and the reconquest of the territories seized by Japan begun. By 1944 it was evident that the war would be won, and that it might be won soon. The invasion of France in June by U.S. and British forces marked the opening of the last act. And it justified the decision of the president to run for a fourth term, to make the peace that was seen to be near. Deciding that Wallace was, for various reasons, impossible as a vice-presidential candidate, the president accepted the nomination of Senator Truman of Missouri, who had acquired a deservedly high reputation as an investigator of war contracts, but was otherwise little known. The

Republicans nominated Governor Dewey of New York, and the campaign was sternly fought. The president was forced, as in 1940, to make a series of campaign speeches, if only to answer widespread rumours about his bad health. He withstood the strain in a fashion that surprised close friends who had begun to worry; but on the long journey to the Crimea to meet Churchill and Stalin and at the Yalta conference (Feb., 1945) there were ominous signs. With victory in sight, however, Roosevelt planned, with his wife, the details of his forthcoming state visit to London, and worked on current problems and on the problems of peace. Neither his wife nor his personal physician was present at Warm Springs, the Georgia spa where he had gone for many years for treatment, when, on April 12, he suddenly and unexpectedly died.

There can be no doubt that Roosevelt's presidency, the longest in American history, will rank as one of the most important for the U.S.A. and incomparably the most important for the world. It saw an immense extension of federal authority and the further exaltation of the presidential office. It saw, too, world history decisively affected by American policy, which was the president's policy, from the decision made in 1940 to resist the triumphant march of the Third Reich to the decision to attempt the manufacture of the atomic bomb. The claim of Roosevelt to greatness was and will be much disputed. But no one disputed his courage, his stubbornness, his political adroitness, which some called his disingenuousness. He was an innovator in the art of politics as well as of government. He was the first to develop to the full the possibilities of radio, not only in formal addresses to congress or to great public meetings, but in the famous "fireside chats" to the American people. If not a great orator, he was a great phrase-maker. He turned the presidential press conference into a great political instrument. No president was more hated, and none more admired and trusted by the masses of the poor and underprivileged who never doubted his concern for them, perhaps because physical accident had made him one of them.

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F. Perkins, 1947; *Nothing to Fear*; *Selected Addresses of F.D.R.*, 1947; *Roosevelt Letters*, ed. Elliott Roosevelt, 1949 et seq.

Roosevelt, THEODORE (1858–1919). American statesman, president of the U.S.A., 1901–08. He was born in New York, Oct. 27, 1858, and entered politics after graduation from Harvard. He quickly stood out as a champion of good government. As Republican leader in the New York state assembly, 1882–84; as Federal civil service commissioner, 1889–95; and as New York City police commissioner, 1895–97, he fought corrupt politicians and all who batted on vice. During this period he spent a year on a ranch, establishing his reputation as a hunter of big game.



Theodore Roosevelt, American president

When the Spanish-American war broke out in 1898, Roosevelt was assistant secretary of the navy, but resigned to become lieutenant-colonel of a Rough Riders regt. raised by himself, which distinguished itself at San Juan Hill, in Cuba. He returned, a popular idol, to be elected governor of New York state, 1899–1900. His enemies, the bosses of his own party, planned to be rid of him by making him vice-president of the U.S. On McKinley's assassination in Sept., 1901, Roosevelt succeeded to the presidency. In 1902 he opened his attack on the trusts and "special interests." In foreign affairs he was equally forceful, mobilising the U.S. navy when Germany sought to seize a Caribbean port, and seizing the chance offered by revolution in Colombia to foil that country in its endeavours to block the building of the Panama Canal. The presidential election of 1904 saw Roosevelt re-elected by an enormous majority.

For his efforts in negotiating peace between Russia and Japan, 1905, he was awarded the Nobel peace prize in 1906. Two years later, suspecting Japanese designs, he sent the U.S. fleet on a world tour as a demonstration of strength. At home he continued his fight against the political machine and the financial interests, initiating a movement for the conservation of the country's natural resources. Refusing a third presidential

term, he procured the election of his successor Taft, and in 1909 left for a scientific hunting trip in E. Africa.

Dissatisfied with Taft's policy, he broke with him to form the Progressive, or Bull Moose, party, running as its presidential candidate in 1912. Though unsuccessful, he ensured Taft's overwhelming defeat. In 1913 he went exploring in Brazil, discovering the Dubida river, but his health was seriously impaired. From the outset of the First Great War he strenuously supported the Allied cause. His four sons all fought in the war, one being killed. Two others died on active service in the Second Great War. Roosevelt died suddenly, Jan. 6, 1919.

His intense Americanism, his astonishing vitality, his supreme self-confidence, his real sympathy for the under-dog, made Roosevelt popular at home and carried his fame abroad. He showed little conception of the vast social changes on the eve of which he lived, and never tackled the underlying problems of tariff, currency reform, or labour. But he was the first to awaken Americans to a conception of their true international position. He built up the U.S. navy and was the first president to make the influence of his country world wide.

His published works included *Hunting Trips of a Ranchman*, 1886; *American Ideals and Other Essays*, 1897; *The Rough Riders*, 1899; *African Game Trails*, 1910; an *Autobiography*, 1913; *The Great Adventure*, 1919. *Consult* *Lives*, N. M. Butler, 1919; W. D. Lewis, 1919; Lord Charnwood, 1923; H. Pringle, 1932; also R. in the *Bad Lands*, H. Hagedorn, 1924; R. and the Caribbean, H. C. Hill, 1927; R. as We Knew Him, F. S. Wood, 1927; T. R., Owen Wister, 1930.

Root. Lower extremity of the main stem in higher plants. Its beginnings are already laid down in the embryo—the plumule which forms the shoot and the radicle which forms the root. The function of the root is to anchor the plant in the soil and to absorb water in which soluble salts are dissolved.

The growing point is protected by a sheath of cells called the root cap, which is renewed from within. The root tip is geotropic and hydrotropic; its hydrotropism may promote it to leave its normally straight course towards water and dissolved plant foods. The root branches laterally; the branch

roots grow away from the main root (exotropism). The lateral branches are produced on all sides of the root and themselves branch. A considerable area of soil may therefore be explored by one plant. If some obstacle checks the onward growth of a root, the tip may work around it and then resume its course. Food absorption is by numerous thin-walled and single-celled root hairs near the root tip.

The growth of root and top is broadly proportional. True roots are limited to the higher plants. In many cases, however, the food collecting function of the normal root hair is supplemented by either symbiosis or mycorrhiza. Legumes provide the characteristic example of root symbiosis. Many trees (e.g., *Pinus*) provide good examples of mycorrhiza in which fungus and root are in partnership to break down the products of organic decay sometimes under anaerobic conditions.

In perennial plants the roots become reservoirs for the storage of reserves to bridge over adverse conditions, e.g. periods of drought or cold. This enables the plant to return to full vigour when more normal conditions return. Selection and hybridisation have produced abnormally succulent roots of sugar beet, parsnip, carrot, mangold, turnip, and others.

Root pruning is practised in horticulture upon trees which

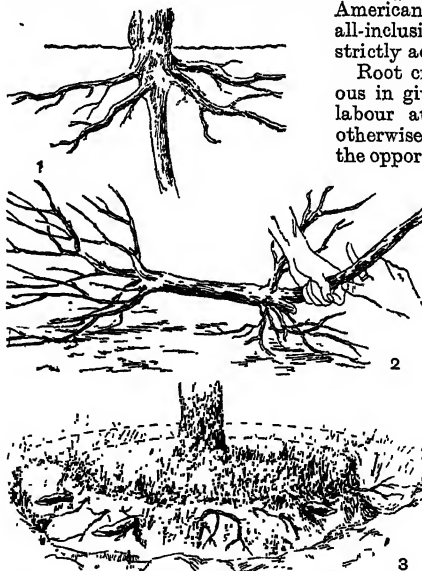
produce much top growth but few fruit buds. The young tree is lifted up cleanly from the ground and the tap root removed. Wood may be cut away freely but all young shoots retained. In large trees the method is to trench round the tree, lever it upwards until the tap root can be cut and the laterals shortened. The vacant space left at the base is filled with soil mixed with compost. The tree is returned to its original position and the trench filled.

Root CROPS. Before the introduction of the turnip into agriculture, land was allowed to remain in a fallow state, i.e. without a crop, at regular intervals, partly to allow of thorough cleaning. But the invention of drilling by Jethro Tull allowed of tillage between the rows for cleaning purposes, while by growing turnips or an equivalent, not only was the productivity of the land increased, but food provided for winter stock, and the necessity for living on salted meat obviated. Such a crop is often known as a fallow crop, because it takes the place of the old bare fallow. The term root crop is not only applied to turnips, swedes, mangolds, sugar beets, carrots, and parsnips, where the part harvested is actually a root, but also to potatoes, which are tubers, or thickened underground stems, and to such things as rape, kohlrabi, or field cabbages, which occupy the same place in a rotation. The American term intertillage crop is all-inclusive, and is therefore strictly accurate.

Root crops are also advantageous in giving full employment to labour at times when it would otherwise be slack, and in affording the opportunity for maintaining the

fertility of the land by the application of heavy dressings of manure. The work begins as soon as harvest is over, is followed by winter and spring ploughing, and afterwards by the preparation of a seed-bed and the sowing of the crop, during the growth of which singling and intertillage make further demands on labour. See *Agriculture*; *Botany*; *Crops*; *Mycorrhiza*; *Plant*.

Root. In philology, that part of a word which remains after it has been stripped of everything forma-



Root. Method of pruning roots of fruit trees. 1. Diagram showing how roots grow. 2. Shortening tap root of young tree. 3. Trench dug round older trees to permit of pruning their roots

tive and accidental. Take the word "examination," from Lat. *examinationem*, accusative of *examinatio*, the verbal noun of *examinare*. *Examin-* is from *exa(g)men*, the scale of a balance (*exigere*, to weigh out), and contains the suffix *-men* (seen in English *acumen*, *regimen*) and the prefix *ex-*, out. Remove these and *-ag-* remains. This is the root, the original idea of which was "driving." Roots have no independent existence, and probably do not constitute the beginnings of language, but are convenient labels under which to classify derivatives. See Philology; Place Names.

Root. In mathematics, a quantity which when multiplied by itself a requisite number of times produces a given expression. Thus the square root of a number is such that when multiplied by itself it gives that number, e.g., 5 is the square root of 25 (written $5 = \sqrt{25}$); and 3 is the cube root of 27 (written $3 = \sqrt[3]{27}$). The number indicating the degree of the root, e.g. $\sqrt[3]{-}$ is called the radix of the root. The values of the unknowns which satisfy an equation are called the roots of the equation.

Root, ELIHU (1845-1937). U.S. statesman. Born at Clinton, New York, Feb. 15, 1845, he graduated at Hamilton College in 1864, and was called to the New York bar three years later. He was U.S. district attorney at New York, 1883-85, and, as secretary of war in McKinley's cabinet, 1899-1904, he reorganized the war department and introduced several reforms into the army. Under Theodore Roosevelt, Root was secretary of state, 1905-09, serving as senator from the latter year until 1915. In 1910 he was appointed member of The Hague tribunal, being awarded the Nobel peace prize in 1912. In 1917 he went to Russia at the head of a diplomatic mission.



Elihu Root,
American statesman

At different times Root sat on many important commissions and tribunals, including the Alaskan Boundary tribunal, 1903, and The Hague tribunal of arbitration between Britain, France, Spain, and Portugal concerning church property, 1913. Chairman of the Republican convention of 1912, he refused nomination for the presidency. As an international jurist,



Root Parasites. Toothwort, *Lathraea squamaria*, a leafless root parasite

he had much to do with setting up the permanent Court of Justice under the League of Nations. He wrote much on international questions, his books including *The Citizen's Part in Government*, 1907; *The Military and Colonial Policy of the U.S.*, 1916. He died Feb. 7, 1937.

Root and Branch Men. Name applied to those members of the English parliament who favoured the policy of destroying episcopacy root and branch in 1640-41. A petition to this effect was signed by 15,000 citizens of London and presented to parliament, Dec. 11, 1640. A bill on these lines was afterwards introduced, but eventually it was dropped. Leading root and branch men were Henry Vane, John Hampden, and Nathaniel Fiennes.

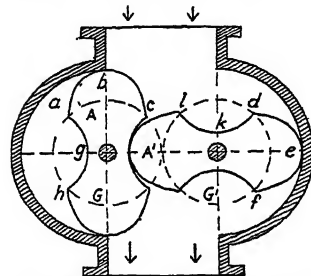
Rootes, SIR WILLIAM EDWARD (b. 1894). British industrialist. He was born Aug. 17, 1894, and educated at Cranbrook School. After serving as pupil engineer, he was in the Royal Navy 1915-17 and later in aircraft engineering. He formed Rootes Ltd., car distributors, in 1919 and gradually built up one of the largest organizations in the motor industry. He served on various official committees, and during 1941-42 was chairman of the supply council, ministry of Supply, and was knighted in 1942.

Rooting on Roding. Name of eight parishes of Essex. Situated between Ongar and Dunmow, they are Abbots or Abbess Rooting, Aythorpe Rooting, Beauchamp Rooting, Berners Rooting, High Rooting, Leaden Rooting, Margaret Rooting, which has a Norman church, and White Rooting, which includes the hamlet of Morrell Rooting, an ancient church and a picturesque Tudor house, Colville Hall. The Rootings take their name from the river Roding (q.v.).

Root Parasites. Plants which attach themselves to the roots of

other plants, from which they absorb water and food. Some of these, like toothwort (*Lathraea*) and broom rape (*Orobancha*), separately described, are total parasites, obtaining the whole of their nourishment in this way, and therefore producing no true leaves. Others, like eyebright (*Euphrasia*), rattle (*Rhinanthus* and *Bartsia*), lousewort (*Pedicularis*), and cow-wheat (*Melampyrum*), are partial parasites, obtaining only crude fluid from their hosts and elaborating it in their leaves.

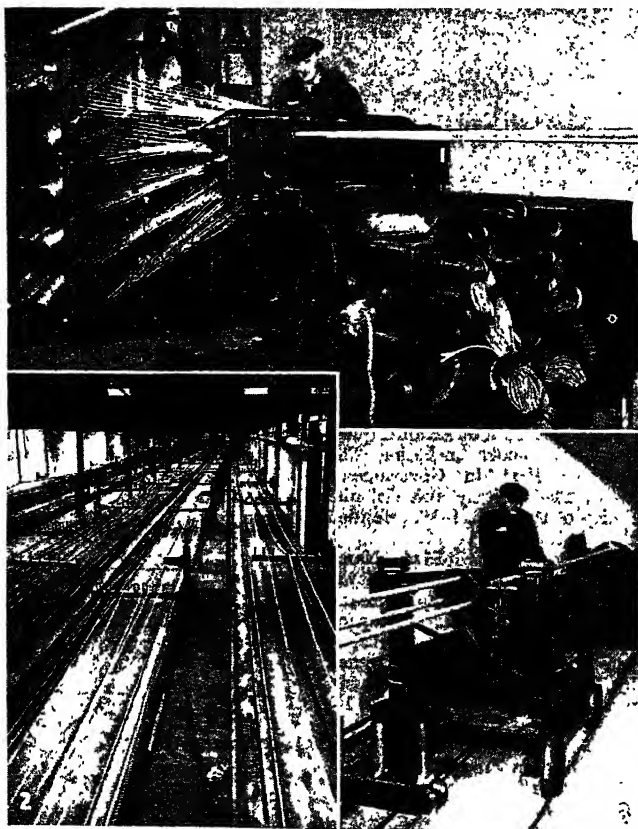
Root's Blower. Form of rotary pump used for providing air or gas under moderate pressure. It was first constructed by P. H. and F. M. Root, of the U.S.A., and was introduced into Great Britain about 1860, largely for use with blast furnaces. It takes a place between the fan and the Blowing Engine (q.v.) and can be run at



Root's Blower. Diagram of the machine. AA', revolving arms. GG', gear wheels. See text

high speeds, since the rotating parts are balanced; but it has the disadvantage, compared with the fan, of a pulsating delivery. It consists of two arms AA' running on parallel shafts, geared to run at equal speeds by gear wheels GG' and fitting as closely as possible to the casing and to each other. Each rotor is essentially a wheel of two teeth only. The epicycloids *abc, def* and the hypocycloids *agh, dkl* being generated from circles rolling on the pitch circles of the wheels GG'. The second rotor is in gear at right angles to the first.

Since the rotors run at high speed and have a comparatively large moment of inertia, the teeth of the driving wheels must be cut very accurately, or frequent breakages will occur. The rotors act as pistons, dividing the casing into two compartments, one of which receives air, while in the other the air is compressed and forced out of the casing. The blower has been used for supercharging small internal combustion engines.



Rope. Stages in the manufacture of rope. 1. Yarn passing from the bobbins through a vertical iron plate and tubes to form strands. 2. Rope walk, 580 yds. long, showing strands passing to twisting machine. 3. The three strands being twisted on travelling machine to form a rope

Rope. Strands of fibre, wire, or other material twisted together to form a pliable cord one or more inches in circumference. The point in twisting the fibres is that mutual friction holds the strands together when a strain is applied to the rope. Until the introduction of rope-making machinery, hemp and flax were the principal materials; hemp is still used for tarred and marine ropes. Where strength and durability are the chief requirements, abaca, commonly referred to as manila, is desirable. Henequen, often misnamed sisal, is the next most important rope material. Jute and cotton make braided ropes; wire and nylon other kinds.

Rope making is one of the oldest industrial arts. Primitive communities fashioned ropes from strips of hide, reeds, rushes, or hair; the ancient Egyptians made them from yarns, and their method of manufacture altered little until the middle of the 19th century. The yarn or hemp was first hackled

or straightened by combing over a board studded with short metal spikes; then, after attaching a few strands to a hook on a spinning wheel, the spinner placed the remainder round his waist, and as the hook on the wheel was revolved by hand, walked backwards feeding the fibre from this supply. A number of yarns were then twisted together into a strand, three strands were twisted to "lay," or form, a hawser. Three hawsers formed a cable.

Machine rope-making processes are essentially the same, irrespective of the materials used. The fibre or other material is carded in a machine which delivers it in a continuous stream or sliver to be coiled on drums. Another machine removes inequalities. Next the slivers pass through a funnel-shaped tube to be wound round the capstan which turns them into yarn and delivers them on to bobbins. The yarns from the bobbins are threaded through holes in a

vertical iron plate, and passed through a fixed iron tube, the ends attached to hooks on a twisting machine which runs on rails laid along the rope walk; as it moves the yarn is twisted into strands.

Strands are twisted into rope on a machine having at its fore end a number of hooks to which the strands are attached. At the other end of the rope walk is the traveller. Between the traveller and the fore end, and running on the rails of the rope walk, is a conical guide-block, through the grooves of which the strands are passed and then fastened to the hooks on the traveller. The hooks on the traveller and on the fore end revolve in opposite directions, and as the strands are twisted the guide block is pushed along the rails by the closing strands.

Some manila ropes are given a wire core, the fibre strands being wound round the wire as the rope is formed. Cable-laid rope consists of three completed ropes twisted together. For tarred ropes the yarns are first passed through tanks of heated tar, then through rollers to squeeze out the superfluous tar, after which they are allowed to dry for a few days before being formed into ropes. In making cord for fishing lines and nets, the yarn is passed through hot starch and drying and polishing rollers to impart the necessary polish.

Wire rope was first made in Germany early in the 19th century, and in 1838 R. S. Newall invented the first machine for its manufacture, but not until the introduction of flexible wire in 1874 did wire rope displace hempen to any extent. It generally has a hemp core round which are twisted wire strands, each built up of from seven to 60 separate wires.

Nylon rope, which is light in weight and very flexible, was introduced in the Second Great War for towing gliders; it is usually woven or braided, rather than twisted, owing to its tendency to ravel.

Roper. River of the Northern Territory, Australia. Formed from the rivers Strangway and Chambers, it flows E. to the Gulf of Carpentaria. Navigation is somewhat impeded by the bar at the mouth, but is possible for boats of 12 ft. draught for 90 m. to Leichhardt's Bar. Stores for the Overland Telegraph were landed at the Roper, and conveyed by the valley route 200 m. to Bitter Springs.

Roper, MARGARET (1505-44). Eldest daughter of Sir Thomas More (*q.v.*). One of the most learned and at the same time one

of the most loved women of her time, about 1525 she married William Roper (1496-1578), her father's biographer. She is said to have secured her father's head after his execution, and to have preserved it until she died. She was buried in Chelsea church, but the head of Sir Thomas is believed to have been discovered in 1824 in a leaden box in the Roper vault at S. Dunstan's church, Canterbury. Many of her letters are extant. Her character is reflected in Ann Manning's *The Household of Sir Thomas More*, a work which purports to be a journal kept by Margaret from her 15th year until her father's death.

Rope Trick. Alleged performance by Indian jugglers. According to the popular story, the performer throws a rope into the air where it remains suspended and a boy climbs up and vanishes at the top. Described in this way, the trick is entirely mythical; the actual trick that has been witnessed consists in elevating a faked, internally stiffened rope up which the boy climbs. The trick has been an Indian fable for over 500 years; no Oriental juggler visiting Europe has ever performed it, while no European juggler visiting India has ever seen it. In 1902 Lord Lonsdale offered £10,000 to anyone performing the real rope trick, and Maskelyne and Devant for years offered £100 a week to anyone who would perform the trick in London. Neither reward nor salary was ever claimed. It is sometimes stated that the trick is a mass hypnotising of the spectators, but this explanation originated only in a short story printed in the *Detroit Free Press* in 1905.

Ropeway. Wire cable on which a carriage is supported and run on wheels for the purpose of transport. Aerial ropeways are an alternative to railway tracks laid on the ground, and in many conditions of terrain, particularly in hilly country and across rivers, afford the only reasonably cheap method of transporting goods.

The first ropeway was built in 1644 by Adam Wybe, a Dutch engineer who used an endless hemp rope passing over pulleys suspended on posts; to the rope were attached a number of tubs which carried earth from a nearby hill for rebuilding the ramparts of Danzig. The first wire ropeway was constructed in 1860 to carry ore from a mine in the Hartz mts. to a railroad. Several later systems were evolved, but basically their principle is the same: that of strong

wire cables strung on towers and carrying the load in suspended buckets.

Fig. 1 illustrates a system suitable for moving very heavy individual loads over long, steep spans. The load is borne on a single fixed cable, and pulled up or let down by an endless hauling rope of smaller diameter. Fig. 2 shows a duplication of the first system. Here the descending load assists to draw up the ascending load. The third system (Fig. 3) employs two fixed carrying ropes and an endless hauling rope travelling always in the same direction. On reaching the end of the track, the buckets and their carriers are run on to a shunt rail, emptied, or filled, and returned to the other track. The carriers automatically let go the hauling rope when entering a shunt, and grip it again when leaving. The jaws of the grips are actuated by the weight of the bucket; the steeper the incline and the greater the pull, the more tightly do they cling to the rope.

In the fourth system (Fig. 4) one endless rope, travelling continuously in the same direction, supports and moves the carriers, which are either attached rigidly to it or grip it automatically. In the second case the carriers can be shunted at the terminals.

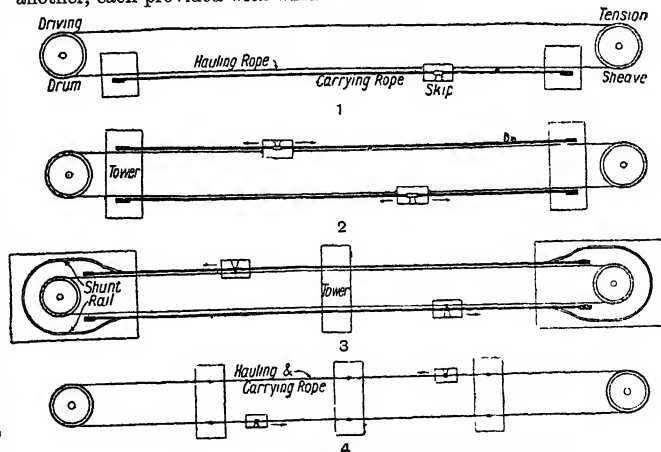
The last two systems are used for long cable-ways designed to carry a rapid succession of moderate loads. If the ropeway has a sufficient gradient, it will work by gravity alone, assuming the loaded carriers to travel downwards. Otherwise power is required to operate it. Very long ropeways are usually divided into sections that are independent of one another, each provided with wind-

ing and tension drums, and the carriers are transferred from one section to the next over short level shunt rails.

At Dorada, Porto Rico, is a ropeway 47 m. long. Built on the single-rope system, it is in 15 sections and has a carrying capacity of 20 tons an hour, some of the cars being fitted for passengers. A ropeway in Argentina connects the mining town of Upalungos with Chilecito, 22 m. away; it works on the fixed carrying-rope system divided into eight sections, including one span of 2,177 ft., and has a total vertical rise of 12,500 ft. A ropeway serving an iron mine in Spain has a single span of nearly 4 m. and carries 85 tons of ore an hour. In the Swiss Alps many small ropeways have been constructed to carry skiers to the tops of the runs.

Rops, FÉLICIEN (1833-98). Belgian artist. Born at Namur, Belgium, July 7, 1833, he spent his youth in Brussels, contributing lithographs to a satirical journal during 1859-60. He lived in Paris after 1874 and his extensive output of drawings and engravings centred largely round political and social satire. Many, however, were erotic or macabre. He experimented with, and developed every technique of the graver and etcher, and was unrivalled in the use of dry-point and soft varnish. During his later years he devoted himself to book illustration, e.g. *Voltaire's Zadig*, *Gautier's Jeune France*, *Peladan's Le Vice Suprême*. He died Aug. 23, 1898.

Roquefort. Village in Aveyron dept., France. It stands on a height, 1,970 ft., among the limestone Causses, 44 m. N.W. of Beziers.



Ropeway. Systems of aerial cable transport. See text

The cheese made here has gained world-wide fame, and has been elsewhere imitated, but not matched because it owes so much to local conditions—the rich grazing land and natural caverns kept humid by underground sheets of water. Roquefort is a soft ewes'-milk cheese, though additions of cows' or goats' milk are sometimes made for commercial reasons. The morning and evening milk are mixed with rennet from lambs' stomachs. Layers of breadcrumbs moulded with a penicillium culture are introduced, and ripened in the caverns from one to five months at 46° F. The mould, as with Stilton, produces a characteristic blue in the white texture.

Roraima. Mountain of S. America, on the borders of Vene-



Roraima. A table mountain in S. America

zuela, British Guiana, and Brazil. Of tabular form, the upper part rises in precipices from 1,600 ft. to 3,000 ft. alt. There are numerous waterfalls, some descending nearly 2,000 ft. Of its several peaks the loftiest reaches an elevation of 8,625 ft. Several rivers tributary to the Essequibo, Amazon, and Orinoco flow from it.

Rorke, KATE (1866-1945). British actress. Born in London, Feb. 22, 1866, she was educated at a convent, and made her first stage appearance at the Court Theatre in 1878. She became a leading London actress during the 1880s, appearing with Hare,



Kate Rorke, British actress

Benson, Tree, and Forbes-Robertson during a long and distinguished career, and playing in Shaw's Candida in 1904. She became professor of dramatic art at Guildhall School of Music, London, in 1906, and later conducted her own dramatic school. She died July 31, 1945.

Rorke's Drift. Place on the Tugela river, Natal, S. Africa. It is 23 m. from Dundee and is famous for the stand made by a few British soldiers against a Zulu army, Jan. 22, 1879. After the disaster at Isandhlwana, the small garrison here was attacked by about 4,000 Zulus. Under Lieuts. Chard and Bromhead, 80 men of the S. Wales Borderers, of whom about one half were in hospital, beat back repeated attacks of the enemy, who finally withdrew. The British loss was 17 killed and 10 wounded. See Isandhlwana; Zulu Wars.

Rorqual (*Balaenoptera*). Small genus of toothless whales. In them the teeth of the cachalots and dolphins are replaced by fringed plates of baleen or "whale-bone," for straining off the small fish, crustaceans, and molluscs, upon which they feed. Of these plates there are more than 300 on each side of the upper jaw. Rorquals are of more slender form than some of the whales; the head is small compared with that of the sperm whale, and there is a dorsal fin.

The floor of the mouth and the throat are thrown into longitudinal folds, allowing of considerable distension when feeding. The females exceed the males in size. Four species are found around the British Isles, of which the common rorqual or finner (*B. musculus*) is from 50 ft. to 70 ft. in length, and feeds largely on herrings. Sibbald's rorqual or blue whale (*B. sibbaldii*) is the largest whale known, a length of 85 ft. being verified, but greater lengths have been reported. The lesser rorqual (*B. rostrata*) attains only about 30 ft.; a common British species, Rudolphi's rorqual (*B. borealis*), about 50 ft. long, is found in the English Channel and occasionally far up the Thames. The blubber yields large quantities of oil, but that of the finner is considered inferior. See Fin-whale; Whale.

Rorschach. Town of Switzerland, in the canton of St. Gall. It stands on the S. shore of Lake Constance, 62 m. by rly. E. of Zürich and 7 m. N.E. of St. Gall. It has excellent bathing facilities. Above it rises the abbey of Marienberg, built in the 15th century, and now used as a seminary. Various

machines, rayon, lace, and muslin are manufactured. Pop. 11,000.

Rosa, CARL AUGUST NICOLAS (1842-89). German operatic impresario. Born at Hamburg, March 22, 1842, his original name being Rose, he appeared in England as a violinist, 1854, studied music in Leipzig and Paris, and directed concerts at Hamburg, 1863-65.



Carl Rosa, German operatic impresario

In 1867 he married the singer Euphrosyne Parepa (1836-74), and toured in America and Britain. In 1875 he formed the Carl Rosa Opera Company (*q.v.*) to play opera in English in London and most provincial centres. Rosa, who actively promoted composition of English operas, died in Paris, April 30, 1889, but his company was continued. His remains were deposited at Highgate cemetery catacombs until a private mausoleum was completed, and he was finally buried on Oct. 15.

Rosa, MARTINEZ DE LA. Spanish statesman and author, properly known as Martinez de la Rosa (*q.v.*).

Rosa, SALVATOR (1615-73). Italian painter. Born at Arenella, near Naples, June 20, 1615, he studied under his uncle, Paolo Greco, and his brother-in-law, Francesco Francanzoro. Adventurous in temperament, he wandered much in the mountains of S. Italy, studying the wilder aspects of nature. Finding his way to Rome in 1635, he was commissioned by Cardinal Brancaccio to decorate his palace at Viterbo. In 1639 he was again in Rome, and distinguished himself at the carnival as actor, poet, and singer.

His success encouraged him to further efforts. Involved in Masaniello's revolution at Naples in 1647, he was a wanderer for the next few years, but returned to Rome in 1652. Having roused hostility by his satirical verses, he withdrew to Florence, where he lived nine years, painting and writing poetry. He died in Rome, March 15, 1673. Salvator was one of the founders of romantic landscape. His gloomy mountain and



Salvator Rosa, Italian painter

forest scenes, his wild seas and dramatic historical pieces are the reflection of his temperament. One may cite especially his Prometheus (Spada Palace), and a large battle picture in the Louvre.

Rosaceae. Extensive family of trees, shrubs, and herbs, natives of various climates throughout the world. The leaves are mostly alternate, and the flowers are of regular shape. The fruit varies greatly; it may be either a fleshy pome (apple and pear), a juicy drupe (plum and cherry), many drupes united (blackberry and raspberry), achenes or nutlets on a fleshy receptacle (strawberry), or on a dry receptacle (silverweed, etc.). About 2,000 species are known.

Rosalba. Signature of the Venetian painter, Rosalba Carriera (*q.v.*).

Rosalind. Heroine of Shakespeare's *As You Like It*, generally regarded as the sunniest and wittiest of his young women. Daughter of the banished duke, she is exiled by her usurping uncle and wanders in the forest of Arden, disguised as a boy, and accompanied by her cousin Celia and Touchstone the clown. There she meets Orlando, with whom she has already fallen in love at court, and teaches him how to woo. When the time is ripe, she reveals herself in woman's dress to Orlando and her father.

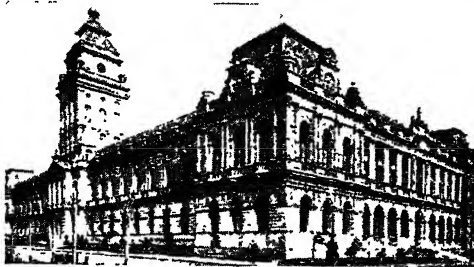
Rosamund OR **ROSAMOND**, called the Fair (c. 1140–c. 1176). Mistress of Henry II of England. A daughter of Walter de Clifford, a knight of the Welsh border, she was, according to tradition, maintained at Woodstock, where the king had a palace, and was acknowledged by him about 1174. On her death soon after, she was buried in the church of Godstow nunnery near Oxford. Legend told of a maze or bower built for Rosamund by Henry, to which Queen Eleanor penetrated with the aid of a silken clue, and forced her rival to drink poison. The ruins of the maze in Woodstock park were shown in the 17th century, and Rosamund's well, a rectangular pool or bath, is still to be seen there. She is introduced in Scott's novel, *Woodstock*.

Rosaniline OR **FUCHSINE**. One of the earliest synthetic dyes, originally made by oxidising a mixture of aniline and ortho and para toluidine with arsenic acid. The base is colourless, the aniline dyes being salts of the compound. See *Magenta*.

Rosapenna. Village and pleasure resort of co. Donegal, Eire.

It stands on an opening off the N. coast of the county, and can be reached from Londonderry by car and steamer. In the late 19th century its beautiful surroundings started to become popular. There are golf links, and it is a good centre for fishing.

Rosario. River port and second city of Argentina. It stands on a high bluff on the right bank of the Paraná river, 214 m. by river and



Rosario, Argentina. The law courts in this important Argentine city and river port

175 m. by rly. N.W. of Buenos Aires. Six rly. lines and many good roads radiate from it over the prov. of Santa Fé, of which it is the capital. Its wharves are reached by ocean and tramp steamers as well as by river vessels, and it is the principal port for the N. provinces. It has numerous grain elevators; wheat, hides, wool, linseed, and other products of the pampas, quebracho, metals, and ores are the main exports.

The city has an electric tramway service and electric lighting in its spacious streets and avenues. The chief industrial establishments are shoe factories, meat packing establishments, sawmills, breweries, tanneries, sugar mills, soap, candle, and grease factories, tobacco and cigar factories, foundries, paper and cardboard factories, brick, tile, and cement works. Pop. 518,515.

Rosary (late Lat. *rosarium*, chaplet of roses). Device for assisting in the repetition of prayers. Largely used by Hindus and Muslims, the practice of counting prayers by beads was probably introduced into Christendom by the Crusaders, though tradition says that a direct revelation for its institution was made to S. Dominic (*q.v.*). The form in common use in the R.C. church is a string threaded with 50 small beads divided into groups of ten by larger beads. The former represent Ave Marias, the latter Pater Nosters, and at the end of each decade is said the doxology. This series of prayers is itself called a

rosary, and many indulgences are attached to the repetition of it. Appended to most rosaries, which are formed in a loop, but not strictly a part, is a string with two large and three small beads, and terminated with a crucifix. The Pater Nosters and Ave Marias represented by these beads are repeated before the rosary is recited.

Rosas, JUAN MANUEL (1793–1877). Argentine statesman. Born at Buenos Aires, March 30, 1793. To safeguard his ranches against Indians he organized an armed force of followers, which ultimately gave him great power. He was made governor of the state of Buenos Aires, and in 1835 became dictator of Argentina. He ruled

with great cruelty, never sparing his enemies, and by mixing in the affairs of Uruguay he brought



Juan Manuel Rosas, Argentine statesman

about the intervention of Britain and France. In 1849 he secured peace with those powers, but in 1852 a rival, Urquiza, defeated him. Rosas fled to England, and spent his last years in retirement at Southampton, dying March 14, 1877.



Rosary used in the R.C. church, with five decades and crucifix attached

Roscher, Wilhelm (1817-94). German economist. Born at Hanover, Oct. 21, 1817, he studied at Göttingen, where he became professor of political economy in 1843, moving to a similar chair at Leipzig four years later. He wrote largely on his subject, his principal work being *System der Volkswirtschaft* (1854-94), which was widely translated, the first vol. pub. in English as *Science of Political Economy Historically Treated*, 1878. Roscher died June 4, 1894.

Roscius (d. 62 B.C.). Roman comic actor, whose full name was Quintus Roscius Gallus. He was born a slave at Solonium near Lanuvium, and reached a perfection in his art that became proverbial. He obtained the favour of the dictator Sulla and enjoyed the friendship of Cicero, who defended him in an action.

The name has been applied to many well-known actors, such as Richard Burbage; David Garrick; William Henry Betty, "the young Roscius"; and Ira Aldridge, an American Negro.

Roscoe, Sir Henry Enfield (1833-1915). British chemist. Born in London, Jan. 7, 1833, and



Sir Henry Roscoe,
British chemist
Elliott & Fry

educated at University College, London, and at Heidelberg under Bunsen, he was appointed in 1847 professor of chemistry at Owens College, Manchester, which afterwards became the university. With this university he was afterwards connected for the rest of his life. He first prepared pure metallic vanadium and conducted other original researches, but he is best known as a teacher of chemistry and an educationist.

Roscoe was a member of the royal commission on technical instruction which resulted in the passing of the Technical Instruction Act in 1889. He was knighted in 1884 and was M.P. for S. Manchester, 1885-95. His *Elementary Lessons in Chemistry and Treatise on Chemistry*, the latter written in collaboration with Schorlemmer, were for long among the most widely used textbooks of the science. He died Dec. 18, 1915. Consult his *Life and Experiences*, 1906; *Life*, E. Thorpe, 1916.

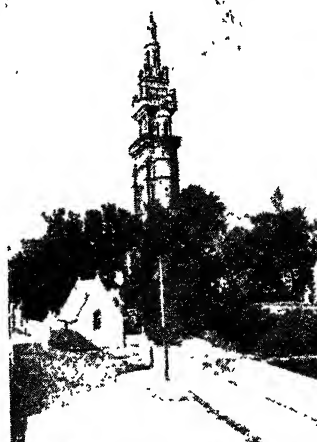
Roscoe, William (1753-1831). English historian. Born at Liverpool, March 8, 1753, he was an



After J. Lonsdale

attorney but abandoned law for literature. His chief works are his *Life of Lorenzo the Magnificent*, 1796, *Life and Pontificate of Leo X*, 1805, and a botanical treatise, 1828. His collected Poems were published in 1857. Roscoe died June 30, 1831. See *Life*, 2 vols., H. Roscoe, 1883.

Roscoff. Town of Brittany, in Finistère dept. It is 17½ m. N.W. of Morlaix. The church of Notre-

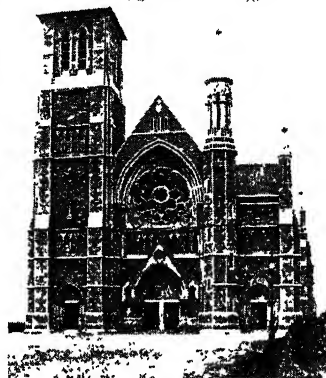


Roscoff, France. Belfry of the church of Notre-Dame-de-Croaz-Baz

Dame-de-Croaz-Baz, 1550, is noted for its minaret-like tower and spire. The chapel of S. Ninian, now in ruins, was built by Mary Queen of Scots to commemorate her landing here in 1548. The hospital dates from 1573, and among other interesting old houses is the mairie. There is a marine laboratory. About 2½ m. off the coast is the île de Batz. Pardons (g.v.) are held in summer.

Roscommon. Inland county of Eire, in the prov. of Connacht. Its land area is 951 sq. m., generally flat, save in the N., where there are hills rising to over 1,000 ft., and to a lesser extent in the E. The Shannon forms the E. boundary; another boundary river is the Suck, and there are the Arigna and the Boyle. Of many lakes the chief are Ree, Allen, Boderg, and Boffin, expansions of the Shannon, also Key and Gara. The chief occupation is rearing sheep, cattle, pigs, etc., but oats and potatoes are grown. The plain of Boyle is

famous for its pasture land. Iron is mined on the Arigna and the Connacht coalfield extends into the co. There are lines of the Eire state rlys. Roscommon is the co. town; other places are Boyle, Elphin, Castlereagh, and Strokes-



Roscommon, Eire. Church of the Sacred Heart

town. Until 1833 Elphin was the seat of a bishop. Roscommon as a co. was established about 1580. The name comes from Ros-Comain, a wood surrounding a monastery. Three members are sent to the Dáil. Pop. 74,062.

Roscommon. Market town and co. town of Roscommon, Eire. It is 18 m. N.W. of Athlone and has rly. connexion with Dublin. The chief buildings are R.C. and Protestant churches. There is a trade in cattle and agricultural produce. The town owes its name and origin to S. Coman, who about 700 founded a monastery here. Later a Dominican priory was founded. There are ruins of a castle, built by English settlers in the 13th cent. Until 1800 two M.P.s were returned to the Irish parliament. Market day, Sat. Pop. 1,900.

Roscrea. Market town of Tipperary, Eire. It stands on the Little Brosna river and near the Slieve Bloom Mts. About 47 m. N.E. of Limerick and 77 m. S.W. of Dublin, it is a rly. junction. There is a trade in agricultural produce, also flour mills, bacon curing, and coach building establishments. Roscrea owes its name and origin to S. Cronan, who in the 7th century founded an abbey here. It was once the seat of a bishop and had two castles built by English settlers, for its position was a commanding one. There is a round tower, partially intact, and in the premises of two churches are remains of two religious houses. Market days, Thurs. and Sat. Pop. 2,772.

THE ROSE: VARIETIES AND CULTURE

H. H. Thomas, Editor of Popular Gardening, 1907-47

For further information see the articles *Gardening*; *Grafting*; *Insect*. See also the two colour plates *Rose*, facing pp. 7096-97

The rose (the family Rosaceae), emblematic flower of England, is represented in gardens by species or wild roses from various parts of the world, and by numerous types and innumerable varieties of complex origin obtained by continued hybridisation or cross-breeding. The pink or white of the wild rose has been cultivated into a great range of colours, from white to deep crimson and from pale yellow to deep gold.

The chief types in cultivation are:

(1) *Rambler and climbing roses*, which are trained over pergolas, arches, and other supports. The favourite ramblers are the wichurianas; most of them are of rampant growth, and their pruning and training entail much labour. Climbing roses are less rampant than ramblers and better suited to small gardens. Climbing "sports" originated from dwarf or bush roses of the same name, e.g. Climbing Ophelia.

(2) *Hybrid tea and dwarf and hybrid polyantha or cluster roses*, which are of low growth and are grouped in formal flower beds and borders. The hybrid teas bloom more or less throughout the summer and autumn. Many are fragrant, some bear large, double, many-petalled blooms, others are semi-double.

The flowers of most of the dwarf polyantha or cluster roses and the taller hybrid polyanthas are single or semi-double; the plants bloom freely in summer and autumn.

(3) *Shrub roses* are treated in much the same way as other flowering shrubs. These roses need the minimum of attention. They grow into bushes varying in height from 3 to about 8 ft. Some flower in summer and autumn; others only in summer. Some true species or wild roses of the U.K. and other lands are suitable for cultivation as flowering shrubs.

Standard roses are budded on stems about 4 ft. tall; weeping standards are rambler roses budded on taller briars.

Roses do best in moderately heavy soil, though they can be grown successfully on light land if the roots are kept moist. The sites for the trees must be dug not less than 20 ins. deep and manured. The best time to plant is in early autumn, but the work may be continued into Dec., when

conditions are suitable, and begun again in Feb. or March.

Dwarf or bush roses should be pruned late in March or early in April. It is sound practice to prune newly planted roses severely, cutting back the shoots or branches to within two or three buds of the base. They will then make strong growth and bear good blooms. Pruning in succeeding years consists in cutting out thin, weakly shoots and shortening the remainder to within three or four buds of the base of the past summer's growth. The hybrid and dwarf polyantha roses may be pruned more lightly.

Newly planted rambler and climbing roses should be cut down to within about 6 ins. of the ground in late March. During the summer they will produce vigorous shoots which must be tied to the supports; they will bear flowers the following summer. In succeeding years these types should be pruned in Sept. or Oct.; old shoots for which there is no room are cut out to make way for those of the past summer's growth, for one-year-old shoots give the best display of bloom. Climbing "sports," however, should be pruned lightly the first year, the shoots or stems being merely shortened by about one quarter. If cut back hard they may revert to the dwarf type and fail to climb.

The roses grown as flowering shrubs need little pruning; old and weakly shoots should be cut out in the autumn, those of the past summer's growth being preserved intact or shortened only slightly.

The chief factor in successful cultivation of roses is the keeping of the roots moist in summer; roses do not flourish in ground that dries out in hot weather. Mulching or top-dressing the soil in spring, after pruning, with manure or material from the compost heap is of great benefit; the trees should be watered from time to time in prolonged dry weather. When the first lot of flowers has faded, the shoots should be cut back by about one third to help in the development of other strong shoots which will bloom later.

The worst trouble to which rose trees are subject is black spot disease. Mulching the soil in summer with grass cuttings or

other material, spraying with a suitable preparation, and gathering and burning diseased leaves are the best measures to take. Aphis, which invariably attacks rose shoots, can be destroyed by a nicotine insecticide. The rose maggot must be searched for and destroyed by hand.

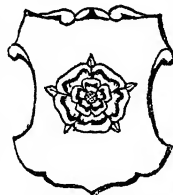
Roses are propagated in late July or early Aug. by budding on briar stocks planted the previous autumn; the work is best done in cool, moist weather. They can also be increased by cuttings inserted out of doors in Oct. and Nov. To obtain early flowers, plant rose trees in large flower pots in Oct., keep them out of doors until the end of the year, and then place them in a greenhouse.

Bibliography. The publications of the National Rose Society, 117 Victoria Street, London, S.W.1, issued to members; *Roses, their History, Development, and Cultivation*, J. H. Pemberton, 1908; *Roses, their Culture and Management*, G. M. Taylor, 1945; *The Romance of Roses*, S. C. Bradford, 3rd. ed. 1974.

Rose. Heraldic emblem. Some shields bear the botanical, others a conventionalised, type of flower.

The latter are composed of four to six heart-shaped petals, with curved-in tips, golden seed centres, usually small green leaves between the petals (seeded and barbed). In cadency, it is the mark of the seventh son and his house. The rose is prominent in English heraldry, the white flower having been adopted as its badge by the House of York, the red by the House of Lancaster. The two were united when Henry VII married Elizabeth of York; he introduced the Tudor rose, first borne quarterly, red and white; then dimidiated red and white; and finally a red rose within a white one.

Rose, JOHN HOLLAND (1855-1942). British historian. Born at Bedford, he was educated at Owens College, Manchester, and at Christ's College, Cambridge, of which he was elected fellow in 1914. Reader in modern history at Cambridge university, 1911-19, he was appointed the first holder of the Vere Harmsworth chair of naval history there in 1919. A leading authority on the history of the Napoleonic period, his chief



Rose in heraldry

works include *The Rise of Democracy*, 1897; *Life of Napoleon I*, 1902; *William Pitt and the National Revival*, 1911; *Nationality as a Factor in Modern History*, 1916; and contributions to *The Cambridge Modern History*. He died March 3, 1942, leaving £2,000 to Christ's College, Cambridge, to endow a scholarship which should encourage the study of the recent history of the British Empire.

Rose and the Ring, THE. Burlesque fairy story by W. M. Thackeray, first published in 1855. Written and illustrated for the amusement of children, the story is the most successful of the great novelist's short Christmas books. In it he was at his happiest both as a master of literary burlesque and as comic draughtsman.

Rose Apple (*Eugenia jambos*). Evergreen tree of the Myrtaceae family. A native of Malaya, it



Rose Apple. Leaves, buds, and flowers. Inset, fruit

attains a height of 20-30 ft., and has oval or lance-shaped, stalked leaves. The four-petalled white flowers are borne on short leafy shoots in clusters of three or five, and are succeeded by more or less oval red fruits, about an inch across, containing one or two poisonous seeds embedded in rose-scented edible pulp. An allied species, known as the Malay Apple (*Eugenia malaccensis*), with red or pink flowers, has more fleshy fruit. A native of Malaya, it has become naturalised in the West Indies.

Roseau. Principal town of the island of Dominica, British W. Indies. Situated on the W. coast of the island, it is an export centre, doing considerable trade in coconuts, bananas, limes and other fruits, and rum. Pop. 9,600.

Rosebery, EARL OF. Scottish title borne by the family of Primrose since 1703. Archibald Primrose (d. 1679), a baronet, became a lord of session, and lord clerk register. His son, Archibald (1664-1723), a supporter of the union of

England and Scotland, was made an earl in 1703. The title passed to his descendants, and Archibald John, the 4th earl, was made a peer of the United Kingdom in 1828. His son and heir, Lord Dalmeny, a Whig M.P., predeceased his father, so when the latter died in 1868 his successor was his grandson. In 1929 the title passed to Albert Edward Harry Meyer Archibald Primrose (b. Jan. 8, 1882), who thus became 6th earl. Dalmeny, near Edinburgh, has been the property of the Primroses for 300 years. See Dalmeny.

Rosebery, ARCHIBALD PHILIP PRIMROSE, 5TH EARL OF (1847-1929). British statesman. Born in London, May 7, 1847, he was the son of Archibald, Lord Dalmeny (1809-51), by his marriage with Catherine (d. 1901), daughter of the 4th Earl Stanhope, who became duchess of Cleveland. Educated at a school at Brighton, and at Eton, and Christ Church, Oxford, he left Oxford in 1868 without a degree, and in the same year succeeded his grandfather as earl.

In 1871 the earl attracted attention by thoughtful speeches. A wealthy marriage and the friendship of Gladstone added to his importance in political circles, and in 1881 he took office as under-secretary to the Home office. He resigned in 1883, but in 1884 entered the cabinet as first commissioner of works, becoming in 1885 lord privy seal. Adhering to Gladstone when Home Rule was introduced, he became foreign secretary in 1886, but the speedy fall of the ministry placed him and his colleagues in opposition. In 1892 he returned to the foreign office, and in 1894, on Gladstone's retirement, became prime minister.

A small majority in the commons and the fact that he, as leader of the party, was in the lords were sufficient to impair the stability of his ministry, but the character and policy of Rosebery, his sympathy with the ideas summed up as imperialism, and his interest in horse-racing (he won the Derby in 1894 and 1895, while prime minister), made him suspect to many Liberals. The upshot was the resignation of the ministry in June, 1895. Rosebery retained the leadership of the party until 1896, when he formally resigned.



Lord Rosebery, British statesman

Rosebery never returned to regular political life, although there were occasions when it seemed as if he would. One such was after he had made a notable speech at Chesterfield in 1901, and another was in 1905, when, after some tentative advances on both sides, he definitely declined to accept Campbell-Bannerman's programme. To support the conclusion of the S. African War he placed himself at the head of the imperialistic section of the Liberal party, and later he came out in opposition to the fiscal proposals of Chamberlain. He denounced the budget of 1909, but his public appearances became fewer until he almost sank out of sight. He died May 21, 1929.

In 1889 Rosebery became the first chairman of the London County Council, but resigned in 1890. He attained eminence as a man of letters. His speeches on literary and kindred subjects were felicitous in phrase and full of thought, while his books show a wide historical knowledge, insight, judgement, and power. The chief are the monograph on Pitt; Sir Robert Peel, 1899; *Napoleon, the Last Phase*, 1904; *Lord Randolph Churchill*, 1906; and *Chatham*, 1910. His *Miscellanies, Literary and Historical*, appeared in 1921. His oratory, too, was full of charm and spontaneity.

He won the Derby again in 1905. In 1892 he was made a knight of the Garter. Lord Rosebery, who in 1911 was created earl of Midlothian, married in 1878 Hannah (d. 1890), daughter of Baron Meyer de Rothschild. She brought him Mentmore, but he preferred as a residence his Epsom house, The Durdans. Their elder son, Lord Dalmeny (b. 1882), was Liberal M.P. for Midlothian, 1906-10, and succeeded as 6th earl. Neil Primrose was the younger son. *Consult* Life, by the Marquess of Crewe, 2 vols., 1931.

Rose Chafer or ROSE BEETLE (*Cetonia aurata*). Species of beetle found in the S. of Britain. Metallic



Rose Chafer or Rose Beetle, actual size

golden green above and coppery beneath, the insect is about $\frac{1}{2}$ in. long. Its larvae feed among vegetable refuse or decaying wood, and are crescentic with hind end somewhat swollen. The adult feeds upon flowers and is often found among roses.

Rose Hip Syrup. Extract made from wild rose hips. Restriction on fruit imports during the Second Great War led to a search for new sources of vitamin C. Significant results were obtained with rose hips from which a palatable syrup was prepared to supply the vitamin to infants and young children who could not obtain enough from vegetables. Dried concentrated extracts were made. Vitamin C content of rose hips varies considerably according to their habitat. In hips from species native to Scotland the concentration of vitamin C is several times that in hips from S. England. At the request of the ministry of food, women's institutes and other bodies organized collections of the berries.

Rose-Mallow (*Hibiscus*). An extensive genus of herbs, shrubs, and trees of the family Malvaceae,



Rose-Mallow. Flower and leaves of *Hibiscus rosa-sinensis*

natives of tropical and temperate regions. Most of the species have showy flowers of various colours, with a double calyx. The name properly belongs to *Hibiscus syriacus*, *H. rosa-sinensis*, and *H. roseus*. *H. syriacus* is a shrub, a native of Syria, whence it was introduced to European gardens in the 16th century. *H. rosa-sinensis* is also shrubby, from China and Japan. It is known as shoe-flower, from a Javanese use of its petals for staining shoe-leather black. *H. roseus* is a N. American perennial herb, with flowers four inches across. Cuba-bast, formerly much used in gardens, was obtained from the inner bark of *H. elatus*, a West Indian tree.

Rose Marie. A musical play by Oscar Harbach and Oscar Hammerstein, Jun., with music by Rudolf Friml and Herbert Stothart. It was produced at the Imperial Theatre, New York, Sept. 2, 1924, where it ran for 581 performances, and at Drury Lane, London, March 20, 1925, when it

reached 851 performances. One of the most popular musical plays of its time, it was revived in London in 1929 and 1942.

Rosemary (Lat. *ros marinus*, sea dew). Hardy evergreen shrub (*Rosmarinus officinalis*) with fragrant leaves,



Rosemary. A flowering spike

member of the family Labiatae. It is a native of S. Europe, whence it was introduced into Britain in 1548. It attains a height of about three ft., and has purple flowers. It is raised from seed sown out of doors in pots, and transplanted into the open ground at a distance of three ft. between the plants. The leaves yield a valuable oil, one of the chief constituents of eau de Cologne. One cwt. of leaves yields over 20 oz. of oil.

Rosenbach, ABRAHAM S. WOLF (b. 1876). American book dealer and bibliographer. Born at Philadelphia, July 22, 1876, he was educated at Pennsylvania university, at which he founded a fellowship in bibliography in 1930. He became secretary of the firm of dealers in rare books and MSS. which bore his name and became internationally famous as a bibliophile, buying many rare books at sales all over the world. In 1898 he edited (with Austin Dobson) Dr. Johnson's Prologue, and compiled a catalogue of books and MSS. of R. L. Stevenson in the Widener library, 1913, writing also a Description of the Widener Four Folios of Shakespeare in 1945.

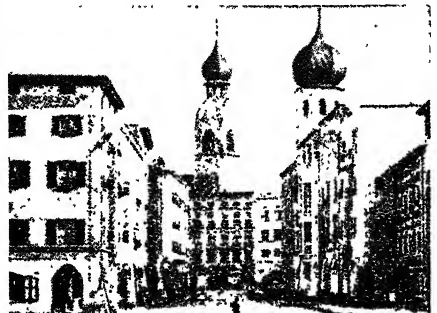
Rosenberg, ALFRED (1893-1946). German writer and politician. Born at Reval, Russia, Jan. 12, 1893, he studied architecture at Riga, and went to Munich 1918, after the First Great War, becoming one of the earliest members of the Nazi party. In 1921 he became editor of the then unimportant paper Volkscher Beobachter, and began to develop in articles, pamphlets, and books a Nazi ideology based upon mysticism, anti-Semitism, and anticlerical Teutonic mythology. Among his books the Myth of the 20th Century (1930) and an

appreciation of Houston Chamberlain (1927) were best known. Elected to the Reichstag 1930, he became head of the party's foreign policy office, and in 1941 was made minister of Occupied E. territories. At Nuremberg he was one of the chief war criminals condemned to death, and hanged Oct. 16, 1946.

Roseneath. Village of Dumbartonshire, Scotland. It stands on the S.W. side of Gareloch, 2½ m. from Helensburgh. Near the village is Roseneath Castle, a seat of the duke of Argyll. In the Italian style, it was built about 1800, near the ruins of an older building, the property of the Campbells. Roseneath features in Scott's Heart of Midlothian. Pop. est. 1,800.

Rosenheim. Town and dist. capital of Bavaria, Germany. It stands at the confluence of the Inn and the Mangfall, 40 m. S.E. of Munich. It is noted for its sulphur baths, and salt works, which give yearly about 200,000 cwt. of salt. The town was known in the 10th cent. and became part of Bavaria in 1247. It has long been noted for the strong Italian influence on its architecture. During the Second Great War, Rosenheim fell with little fighting to the U.S. 7th army May 3, 1945. After Germany's surrender it lay in the U.S. zone of occupation. Pop. (1935) 18,132.

Rosenkavalier, DER. Opera in 3 acts with libretto by Hugo von Hofmannsthal and music by Richard Strauss. Composed in 1909, and produced at Dresden, January 26, 1911, and at Covent Garden, 1913, this opera marks a modification in the composer's style compared to his preceding opera Elektra. Based on the rhythm of the Viennese waltz, the music contains also an element of Mozartian melody. The score is notable for its brilliant waltzes, the entry of the Rosenkavalier in act II. the trio of three female voices, and the soliloquy of the Princess at the end of act I.



Rosenheim, Germany. Street of the Holy Ghost

Rosenthal, MORIZ (1862-1946). Polish pianist. Born at Lemberg, Dec. 19. 1862 he studied there and



Moriz Rosenthal,
Galician pianist

in Vienna, where he made his first concert appearance in 1876. He studied also under Liszt, 1876-78, appeared in Paris and St. Petersburg, 1878, and retired from public playing, 1878-84,

in order to study classics and philosophy. His superb technique and great interpretative powers made him one of the foremost pianists of the day, and he toured widely in Britain, Europe and the U.S.A. He died Sept. 3, 1946.

Rose of Jericho (*Anastatica hierochuntina*). Annual herb of the family Cruciferae. A native of Syria and N. Africa, it has somewhat oval leaves and small white, four-petalled flowers. After flowering, the leaves fall off, and the stalks curve towards the centre of the plant, forming a lattice sphere, in which form the plant dies and dries, gets blown out of the ground, and bows along before the wind. On coming, perhaps many months later, into moist surroundings, all the parts straighten out—the so-called rose expands, and the seed-pouches open and disperse their contents.

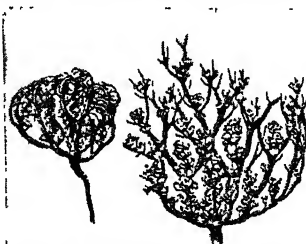
Rose of Sharon. Name of an unknown flower, perhaps the autumn crocus, or a narcissus, mentioned in The Song of Solomon, ii. 1. The name is popularly given to *Hibiscus syriacus*, an ornamental shrub related to the mallows, and to *Hypericum calycinum*, the large St. John's wort (q.v.)

Roses, WARS OF THE. Contest between the rival houses of Lancaster and York for the crown of England, in the 15th century. It is so called because the Lancastrians assumed the red rose and the Yorkists the white as their badges. In 1447 Henry VI, by the death of his uncle, Humphrey, duke of Gloucester, became the sole legitimate representative of the house of Lancaster. The heir presumptive to Henry was Richard, duke of York, who through his mother, Anne Mortimer, represented Lionel, duke of Clarence, the second son of Edward III. Strictly speaking, if the Mortimer line be regarded as being in the royal succession, he was the rightful heir, but the house of Lancaster had been placed in a privileged position in 1399.

King Henry VI periodically became insane. Richard, as next

prince of the blood, claimed a leading place in the Council, and the foremost place when the king was incapacitated. Hence there was a continual struggle between Richard and his partisans on the one side and the queen and the Beauforts on the other. In Oct., 1453, an heir was born to Henry, and Richard's expectation of one day succeeding naturally to the throne was dashed.

Still there was no open collision until 1455, when York, realizing that he was in danger of being attainted for treason, took up arms in self-defence, and the first battle of St. Albans began the Wars of the Roses in May. York was victorious, and his ascendancy was temporarily secured. There was a superficial reconciliation, till again in 1459 he was driven to take up arms, but his followers were scattered, and he and his principal supporters, Salisbury and Warwick, had to fly the country. In the summer of 1460 they reappeared in arms. The king was defeated and taken prisoner at Northampton,



Rose of Jericho, showing, left, the curved stalks of the dead plant, and, right, the plant expanded for the dispersal of the seeds

July 10, and York, proceeding to London, startled his supporters by asserting that he himself was the rightful king, and that the reigning house were usurpers. Both he and Henry, however, were persuaded to adopt a compromise, recognizing Henry as king for life, but Richard, instead of the prince of Wales, as heir to the throne.

The queen, however, resolved to fight for her son's rights. On Dec. 30 York was defeated and killed at Wakefield. His son Edward defeated a Lancastrian force at Mortimer's Cross, Feb. 2, 1461, marched to London, and, supported now by Warwick, proclaimed himself king. On March 29, at Towton, Edward and Warwick shattered the Lancastrian forces; Henry and his queen both fled out of England. A Lancastrian rising was suppressed in 1464 by the battles of Hedgeley Moor and Hexham. But in 1469 Edward had completely alienated Warwick, the

man to whom he really owed his throne. In 1470 a revolt was raised which Warwick had fostered. The insurgents were defeated in the fight called the Battle of Lose-Coat Field, and Warwick fled to France, where he became reconciled to Queen Margaret. Henry had been caught and imprisoned in the Tower some time before. In September Warwick returned to England in arms. Edward was taken by surprise and was forced in his turn to fly the country; Henry was once more taken out of the Tower and proclaimed king.

End and Results of the Contest

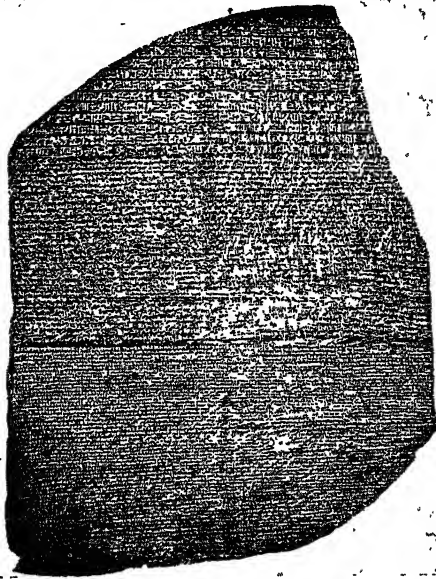
But on March 14, 1471, Edward was back in Yorkshire; on April 14 he defeated and killed Warwick at Barnet; and on May 4, at Tewkesbury, shattered a second Lancastrian force, headed by Queen Margaret, killed the young Prince Edward, captured the queen, and then a few days later killed the unlucky Henry VI. The House of York was now firmly established on the throne, the only representative of the Lancastrians being Henry Tudor, earl of Richmond, son of Margaret Beaufort. Nevertheless the tyrannical government of Richard III (1483-85) gave the Lancastrians one more opportunity. In 1485, Richmond, who had been in exile, landed in England. Richard was killed at the battle of Bosworth, on Aug. 22, Henry Tudor was proclaimed king, and by his marriage in Jan., 1486, to Elizabeth, daughter of Edward IV, united the houses of Lancaster and York, thereby ending the contest.

The whole struggle had been one in which no principles were at stake, a war entirely dominated by the personal and family interests of the great nobles. To the people at large the victory of Yorkists or Lancastrians was a matter of indifference, and they took as little part in the contest as they could. But in the course of it the old noble families were nearly exterminated. Estates were forfeited and redistributed; on the ruins of the old system new fortunes were founded by a large number of small men instead of a small number of big men, and after the Wars of the Roses there was never again a danger that the crown would be held at the mercy of a new Warwick the Kingmaker. See England: History; Lancaster; York; consult also The Wars of York and Lancaster, E. Thompson, 1892; The Houses of Lancaster and York, J. Gairdner, 9th ed. 1896; The Strife of the Roses and Days of the Tudors in the West, W. H. H. Rogers, 1900.

A. D. Innes

Rosetta. Town in Egypt, on the Bolbitinic arm of the Nile delta, 15 m. N.E. of Alexandria. Once an important harbour, it is now, owing to the rise of Alexandria, unimportant. Pop. 25,684.

Rosetta Stone. Inscribed black basalt slab from Rosetta, lower Egypt. It was discovered by one of Napoleon's officers in 1799 and acquired by Great Britain at the capitulation of Alexandria, 1801. It reached the British Museum in 1802. It bears an inscription in three versions, hieroglyphic, demotic, and Greek, of which the Greek was translated by Weston, and the demotic partly deciphered by Akerblad, 1802. Thomas Young identified the hieroglyphic name Ptolemy, 1818; Champollion, by completing the decipherment, through modern Coptic, furnished the long-sought key to hiero-



Rosetta Stone. Inscribed slab of black basalt that furnished the key to hieroglyphic writing

woman, born in Guernsey. He published in 1840 a volume of translations from Byron, Voltaire, and Lamartine. During a ten years' exile in Paris, after the revolution of 1848, he devoted himself mainly to propaganda for the Rumanian revolution. In 1861 he returned to Bukarest, and became president of the chamber in 1876. He died April 20, 1885.

Rosewater. Water tintured with the essence of roses obtained by distillation. A rosewater dish is a bowl designed to hold rosewater which can be sprinkled over the hands. They are frequently used in the East after eating, and occasionally in Western countries replace the customary finger-bowl. Several examples belong to the Clothworkers' Company, including one presented by Samuel Pepys.

Rose Window.

In architecture, a circular window divided into a number of compartments by tracery. Large windows of this type are a feature of the fronts of the great cathedrals; they are

generally filled with stained glass. When the tracery radiates in a more or less definite pattern from the centre, the window is often called a catherine wheel window. See Architecture; Cathedral; York.

Rosewood. Commercial term applied to the dark coloured timber of many distinct species of trees. The American product is from *Dalbergia nigra*, and species of *Machaerium*. Burmese rosewood is *Pterocarpus indicus*; Canary rosewood is the striped wood of a shrub (*Convolvulus scoparius*); Dominica rosewood is *Cordia gerascanthus*; Indian rosewood, *Dalbergia latifolia* and *D. sissooides*; Jamaica rosewood, *Amyris balsamifera*; Moulmein rosewood, *Millethia speciosa*; New South Wales rosewood, *Trichilia glandulosa* and *Disocylon fraserianum*; Queensland rosewood, *Acacia glaucescens*. It is much used in the making of furniture.

Rosherville Gardens. Once popular London pleasure resort. It was formed in a chalk quarry, between Northfleet and Gravesend, on the S. bank of the Thames, and opened in 1837. The attractions included a theatre, dancing platform, a look-out tower with windows of coloured glass, and a restaurant. Advertising made the gardens familiar as "the place to spend a happy day," but their popularity waned. The gardens, named after Jeremiah Roshier, by whom they were established, were sold to an oil company, 1920.

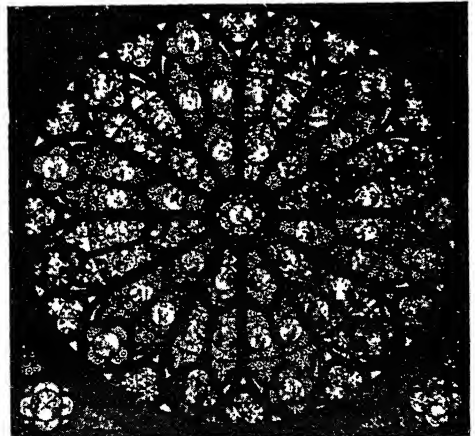
Rosh Hoshanah. Jewish new year's day. It does not correspond regularly with any day of the calendar year, but falls in Sept. or Oct. The actual date of its occurrence is determined by



Rosewater dish and ewer, presented to the Clothworkers' Company by Samuel Pepys, Master, 1677-78

glyphic writing. Hieroglyphs missing from the fractured top were recovered from a Damanhur slab found in 1898, now at Cairo. The text records the priestly decree of Memphis, 196 B.C., in honour of Ptolemy V Epiphanes. See Hieroglyphs.

Rosetti, CONSTANTIN (1816-85). Rumanian poet and statesman. A native of Bukarest, he married in 1845 Marie Grant, an English-



Rose Window. Stained glass window, nearly 41 ft. in diameter, formerly in the façade of Reims Cathedral. It was destroyed during the First Great War

computation from the movements of the sun and the moon. It cannot be celebrated on a Sunday, Wednesday, or Friday, and if any of these days should be found as a result of the computation, the actual celebration is postponed to the following day.

Rosicrucians (Lat. *ros*, dew; or *rosa*, rose; *cruz*, cross). Name given to a secret brotherhood of which much has been written, but little is known. It did not attract wide attention in Europe until the early part of the 17th century, when it arose in Germany, and spread thence to France, and, through the agency in particular of Robert Fludd (*q.v.*), to England. The keystone of the Rosicrucian arch is an idealised form of alchemical philosophy. The sign of the order was a rosy cross, and its name is derived by some authorities from dew (*ros*), regarded as a solvent of gold, and identified with light because the figure of a cross (*cruz*) contains, in various presentations, the three capital letters of the word *lux*=light, or knowledge.

Rosicrucianism, in one form or another, still exists. The Societas Rosicruciana in Anglia has headquarters in London and has published Transactions. France has its Ordre de la Rose-Croix and other bodies claiming knowledge of Hermetic mysteries. In the U.S.A. a

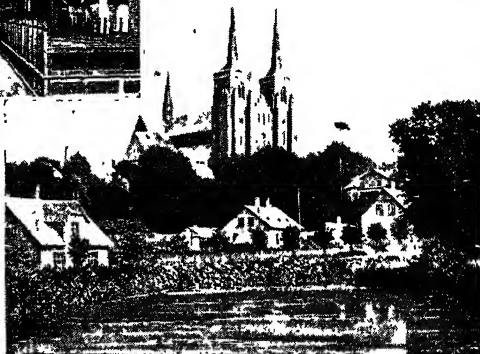


that the kingdoms of grace and nature are governed by the same divine laws; that the world is a great musical instrument, and the "harmony of the spheres" a true thing.

Astrology, magic, and demonology were vaguely taught, and it is said that the initiated claimed the power of seeing and communicating with elementary beings, "children of the elements," invisible to grosser eyes, as well as the possession of the *elixir vitae*. To them, or to ideas associated with them, are attributed Shakespeare's Ariel, the machinery of Pope's Rape of the Lock, Fouqué's Undine, Lytton's

Zanoni and A Strange Story, and Scott's White Lady of Avenel. De Quincey Works, ed. Masson, vol. xiii) suggested that the foundation of Rosicrucianism was laid in a romance by a German theologian, John Valentine Andrea (1586-1654). See Freemasonry; Mystery. Consult The R., Their Rites and Mysteries, Jennings, 4th ed. 1907.

Roskilde. Seaport of Denmark, on the island of Zealand. It stands at the head of Roskilde Fjord, 20 m. by rly. W. of Copenhagen, a



Roskilde, Denmark. The cathedral, from the head of the fjord. Top, left, interior of chancel, with high altar



friendly society called the Rosicrucian Order maintains at San Jose, Calif., a museum of Oriental subjects. The doctrines of the Rosicrucians, who were pledged to heal the sick without fee or reward, appear to have included the thesis that fire is the universal means of analysis;



Roslin, Scotland. Ruins of the castle. Top, left, interior of the chapel looking east

junction on the line to Konsör. It has a splendid cathedral, founded in 1074, and rebuilt in the 12th century, containing the tombs of many Danish monarchs. Until devastated by plague and fire, it was the most important town of Denmark, and the capital down to 1443. It gave its name to the treaty, 1658, by which Sweden secured all Danish possessions beyond the Sound. Pop. 23,497.

Roslavl. Town of R.S.F.S.R. It is in the region and 70 m. S.E., of Smolensk, on the Orel-Vitebsk rly. There is considerable trade in grain, skins, fat, and tobacco. Flax and hemp are cultivated in the district. Evacuated during the German advance in 1941, Roslavl was retaken by the Russians on Sept. 25, 1943. Pop. est. 23,000.

Roslin or **ROSSLYN.** Village of Midlothian, Scotland. It stands on the N. Esk, 6 m. S. of Edinburgh, with a rly. station. It has a castle built on the site of a seat of the Sinclair family. The chapel is celebrated for carvings, especially the beautiful prentice pillar; it was built in the 15th century and was the burial place of the lords. Roslin was made a burgh in 1456, but later its importance declined. There are some small manufactures. The place gives the title of earl to the family of St. Clair Erskine. In



1 Dog Rose (*Rosa canina*) 2 Moss Rose (*Rosa muscosa*) 3 Red Damask (*Galliae*) 4 Gussan Tepitz (H.F.) 5 Pharisae (H.F.) 6 Marie Van Houtte (Tea) 7 Jersey Beauty (*Wichimiana*) 8 Wm. Allen Richardson 9 Noisette 10 A. St. Pierre 11 A. J. G. 12 Caroline Testout (H.F.) 13 Mme. Edouard Herriot (Daisy Mul. Rose) (H.F.) 14 Gloire de Dijon (Tea) 15 Mme. Victor Verdier (H.F.)

ROSE: CULTIVATED FORMS PRODUCED FROM THE WILD PARENT STOCK See text p. 7091



16. Mme. Ravary (H.T.) 17. Mrs. Bosquet (Ch.)
 18. Prince de Bulgarie (H.T.) 19. Ir. l. Elegance (H.T.)
 20. Frau Karl Druschki (H.P.) 21. Lady Hillingdon
 (Tea) 22. Lady Ashdown (H.T.) 23. General McArthur
 (Rugosa) H.P. = Hybrid Perpetual; H.T. = Hybrid Tea
 (H.T.) 24. Kaiserin Augusta Victoria (H.T.) 25.
 Melanie Souper (H.T.) 26. Ophelia (H.T.) 27. Inde-
 pendence Day (H.T.) 28. Hugh Dickson (H.P.)
 29. Dorothy Page Roberts (H.T.) 30. Conrad F. Meyer

ROSE: BEAUTIFUL VARIETIES OF THE QUEEN OF FLOWERS. See text p. 7091

1303 there was fighting between the English and the Scots on Roslin Moor. Pop. est. 1,500.

Rosmer, MILTON (b. 1881). British actor. Born at Southport, Nov. 4, 1881, and educated at Manchester grammar school, he made his stage debut in 1899. A leading member of Miss Horniman's company at Manchester, 1910-15, he appeared in London successes after the First Great War, e.g. *St. Joan*, 1924; *Many Waters*, 1929; *Gas Light*, 1939. Other rôles included *Cassius* in *Julius Caesar*, *Helmer* in *A Doll's House*, *Bluntschli* in *Arms and the Man*.

Rosmini-Serbatì, ANTONIO (1797-1855). Italian philosopher and theologian. Born at Rovereto,

March 25, 1797, he studied at Pavia and Padua, became a priest in 1821, and in 1828 founded the Institute of the Brethren of Charity, an

order more generally known as Rosminians. The English centre is S. Etheldreda's, Ely Place, London. For his philosophical views Rosmini was attacked by the Jesuits, for his advanced political and social ideas by the Austrians. Against empiricism and sensualism he propounded a system of idealism, issuing from the thinking self (psychologism). The knowledge of the real is conditioned by the ideas. He died July 1, 1855. His numerous works include *A New Essay on the Origin of Ideas*, 1830, Eng. trans., 3 vols, 1883-84; and *Psychology*, 1846-48, Eng. trans., 3 vols., 1884-88.

Ross. Market town and urban dist. of Herefordshire, England. It stands on the Wye, 12 m. from Hereford, with a rly. station. The

chief buildings are the church of S. Mary the Virgin, a fine old building in the Decorated and Perpendicular styles, and the picturesque market house. The man of Ross, John Kyrle (q.v.), is buried in the church. The town has manufactures of agricultural implements, boots, and flour. Market day, Thurs. Pop. 4,700.

Ross. Famous Scottish earldom. It came into existence about 1164, when a certain Malcolm was made, by King Malcolm IV, earl of the district now represented by Ross-shire. It passed from one lord to another until about 1430, when James I gave it to Alexander Macdonald, lord of the isles. In 1476, the Macdonalds lost it, and in 1481 it was given to James, a younger son of James III. He was made duke of Ross, but after his time the title died out.

Ross, SIR EDWARD DENISON (1871-1940). British orientalist. Born June 6, 1871, he was educated at Marlborough, and London



Sir E. Denison Ross,
British orientalist

university. After studying Oriental languages in Paris and Strasbourg, he visited Asia, and, after five years as professor of Persian at London university, in 1901 became principal of the Madrasah, Calcutta, a post which was combined in 1906 with that of curator of records (government of India). He promoted the study of Tibetan, and assisted in bringing about the cataloguing of the Khuda Baksh library at Bankipur, which contained the finest collection of Persian and Arabic MSS. in the world. In 1914 Ross became assistant in the prints and drawing department

of the British Museum, his section being the art of the East. During the First Great War he became director of the School of Oriental Studies, London university. He was knighted in 1918. In 1940 he was head of the British information bureau at Istanbul, where he died Sept. 20, 1940.

His publications included *A History of the Moguls of Central Asia*, 1898; *The Heart of Asia*, 1899, and contributions to Oriental journals.

Ross, SIR JAMES CLARK (1800-62). British explorer. Born in



Sir James Ross,
British explorer

London, April 15, 1800, he went to sea at the age of 12 and served in the Arctic expeditions of W. E. Parry (q.v.), 1821-27. Member of Booth's expedition of 1829-33, he discovered the magnetic pole in 1831. In 1839 he was given command of an Antarctic expedition with the *Erebus* and *Terror* vessels, discovering Victoria Land and Mt. Erebus, and reporting that the South Pole was unattainable. Knighted on his return, 1843, he published *A Voyage of Discovery in the Southern and Antarctic Seas*, 1847. He died April 3, 1862.

Ross, SIR JOHN (1777-1856). British explorer. Born June 24, 1777, he entered the navy when a

boy. In command of the *Isabella*, he was sent in 1818 to discover the north-west passage, but after passing Baffin Bay he returned. In 1829 he commanded the *Victory*, a



paddle steamer, on a similar voyage. After three years spent in the ice amid great hardships, he was picked up by a whaler and returned home. Ross was knighted for his services, and in 1851 was promoted rear-admiral, having taken part in a search for Franklin in the previous year. He died Aug. 30, 1856.

Ross, MARTIN. Pseudonym of Violet Florence Martin (d. 1915), Irish novelist. Educated at Alexandra College,



Martin Ross,
Irish novelist

Dublin, she spent her early years at Ross, co. Galway, which place provided her pen-name in her long collaboration, which began in 1887, with her



A. Rosmini-Serbatì,
Italian philosopher



Ross, Herefordshire. The old market house

cousin Edith Oenone Somerville (q.v.). She died Dec. 21, 1915.

Ross, Sir Ronald (1857-1932). British physician and poet. Born May 13, 1857, he entered the



Sir Ronald Ross,
British physician
Elliott & Fry

Indian Medical Service in 1881. He investigated the connexion of mosquitoes and blood parasites during 1897-98, and in the course of an expedition to W. Africa in 1899 confirmed his findings as to the transmission of such parasites (see Malaria). For this work he received the Nobel prize for medicine in 1902. Throughout the First Great War he was War office consultant on malarial problems, and later became director of the Ross institute and hospital for tropical diseases at Putney. He was knighted in 1911, and died Sept. 16, 1932.

A poet of distinction and writer of romance, he wrote *Poems*, 1928; *The Revels of Osera*, 1930; *Lyra Modulata*, 1931. His memoirs appeared in 1923, and a biography by R. L. Méroz in 1931.

Ross, Sir (William) David (b. 1877). British scholar. He was born April 15, 1877, and educated at Edinburgh high school and university, and at Balliol College, Oxford. He held various posts at Oxford, becoming in 1923 professor of moral philosophy there. He also served on many government commissions, being chairman of the royal commission on the press which was appointed in 1947. Provost of Oriel from 1929 to 1947, vice-chancellor of Oxford, 1941-44. He wrote many books on philosophy, and was editor of the extensive translation of Aristotle's works sponsored by Oxford university and published during 1908-31.

Rossa, O'Donovan (1831-1915). Irish Fenian leader. Born at Ross-carbery, co. Cork, his real name was Jeremiah O'Donovan, and he early became connected with the Fenian brotherhood. Sentenced to 20 years' penal servitude for treason-felony in 1865, he was elected M.P. for Tipperary, 1869, and was released conditionally in 1871. He then resided in the U.S.A. and opened a fund for the support of dynamite outrages. He visited England in 1894, and attempted to address the house of commons. Expelled from the

Fenian brotherhood in 1886, he had little political influence in later days, and died in New York, June 29, 1915.

Rossall School. An English public school. It stands on the seashore at Rossall, Lancs, 3 m. S. of Fleetwood, the nearest rly. station, the school grounds having a frontage of $\frac{1}{2}$ m. Founded in 1844 as the North Church of England school, Rossall was incorporated in 1890. There are about 500 boys, accommodated in eight houses; there is also a separate preparatory school. The school chapel, enlarged after the First Great War, contains a carved reredos by Eric Gill.

Ross and Cromarty. County of Scotland. One of the largest in the country, its area being 3,089 sq. m., it consists of the two originally separate counties of Ross and Cromarty, which were united in 1889. It has a long, irregular coast-line, pierced by Dornock Firth, Cromarty Firth, and Beaulie Firth on the E., and by Lochs Broom, Ewe, Torridon, Carron, and Alsh, and the Gairloch on the W. It includes parts of Lewis and several of the smaller islands of the Hebrides.

The surface is very mountainous, the highest peak being Carn Eige (3,877 ft.), Mam Soul (3,862 ft.), Ben Wyvis, Ben Attow, and several others, all over 3,000 ft. Of the rivers the chief are the Orrin, the Oyckell, separating it



Rossall School. Main gateway and school buildings

from Sutherlandshire, and the Conon. Lochs are Maree, Fannich, Luichart, Glass, and many others. Most of the surface has been given up to deer forests; sheep and cattle are reared; the fisheries are valuable, and game is abundant. Dingwall is the county town, others being Stornoway, Tain, Cromarty, Fortrose, Invergordon, and Strathpeffer.

Ross and Cromarty originated as two earldoms, having previously been included in the province of Moray. Ross was made a county in 1661, and Cromarty in 1685. The latter consisted of detached pieces of territory scattered



Ross and Cromarty. Map of the large Scottish county. Inset, part of Lewis and smaller islands of the Hebrides included in the county

throughout Ross-shire, a fact which made their union desirable. One member is returned to parliament. Pop. 60,700.

Rossano. City of S. Italy, in the prov. of Cosenza. It is 28 m. N.E. of Cosenza near the Gulf of Taranto. A well-built walled city, it contains an old castle, a Byzantine cathedral, and a library with a valuable MS. of the Gospels, which escaped damage during the Second Great War. Silk, olive oil, marble, and alabaster are the chief products. Pop. est. 16,000.

Rosbach, BATTLE OF. Battle of the Seven Years' War. In it Frederick II inflicted decisive defeat on the German and French forces, Nov. 5, 1757. Rosbach is a small village of eastern Germany, 22 m. W.S.W. of Leipzig. The allied troops crossed the Saale with a view to attacking Leipzig, and took up a strong defensive position on the left bank.

Soubise attempted to outflank Frederick, who, making a feint of retreat, drew the allies from their strong position, and suddenly attacked. Within two hours the allied armies were completely scattered, the Germans retreating into Bavaria, and Soubise making northward. See Frederick II; Seven Years' War.

Rosberg. Mountain of Switzerland. In the cantons Zug and Schwyz, between the lakes of Zug, Lowerz, and Aegeri, its highest

1588 by Elizabeth to Sir Valentine Browne. In 1652 it was captured by Cromwell's soldiers. It was while visiting here that Tennyson wrote part of *The Princess*. See Killarney, Lakes of.

Rosse, WILLIAM PARSONS, 3RD EARL OF (1800-67). British astronomer. Born at York, June 17, 1800, he was educated at Trinity College, Dublin, and Magdalen College, Oxford. From 1821 to 1832 he represented King's County in parliament, resigning in the

latter year in order to devote himself to astronomical pursuits. He greatly improved the technique of casting speculum mirrors, and with a 6-ft. reflector, first mounted in 1845, made many valuable observations of nebulae and star clusters, and announced the discovery of spiral nebulae. He was president of the Royal Society 1849-54. He died Oct. 31, 1867.

The earldom dates from 1806, when it was bestowed upon an Irish baron. The family seat is Birr Castle, near Parsonstown, and the earl's eldest son is called Lord Oxmantown. In 1918 Laurence Michael Harvey Parsons (b. Sept. 26, 1906) became the 6th earl.

Rosselli, Cosimo (1439-1507). Italian painter. Born at Florence, he studied under Neri de Bicci, worked at Rome, where he was employed on the decoration of the Sistine Chapel, and at Florence, where his masterpiece is a fresco in S. Ambrogio. Piero di Cosimo and Fra Bartol-

ommeo were his pupils. He died at Florence.

Rossellino, BERNARDO (c. 1409-64). Italian sculptor and architect. Born at Settignano, he worked chiefly at Florence. One may cite among his sculptures the Beata Villana tomb in S. Maria Novella, Florence, and the mausoleum of Leonardo Bruzzi, of Arezzo, in Santa Croce. He built the Vatican for Pope Nicholas V, reconstructed churches in Rome, and executed important works at Sienna, Spoleto, and Pienza. He died at Florence.

Rossetti, CHRISTINA GEORGINA (1830-94). British poet. She was born in London, Dec. 5, 1830, and delicate in health from the age of 15. On the threshold of womanhood an unfortunate love affair made a deep impression on her mind, and helped to give to her writing its note of sadness.

She was a keen observer of nature. Her first poetry was written in 1842, and much of the best of it was the work of her earlier years. Her knowledge and affection for country scenes was gained from visits in childhood to Holmer Green, near Little Missenden, Bucks. As published, her works include *Verses*, privately printed 1847; *Goblin Market and Other Poems*, 1862; *The Prince's Progress and Other Poems*, 1866; *Singsong*, a book of nursery rhymes, 1872; *A Pageant and Other Poems*, 1881; *Verses*, 1893; *New Poems*, 1896. She also wrote some short stories and devotional prose, notably *Time*



3rd Earl of Rosse, British astronomer



Christina G. Rossetti

After D. G. Rossetti

Flies, 1885. Her death took place, after a long and painful illness, Dec. 29, 1894, and she was buried in Highgate cemetery. A memorial reredos-painting, designed by Burne-Jones and executed by T. M. Rooke, was afterwards placed in Christ Church, Woburn Square.

In English literature Christina Rossetti takes her place with Herbert, Crashaw, and Vaughan, and as a poet of the Oxford Movement, with Keble and Newman. While death, the grave, and renunciation are constantly her themes, and some of her lyrics, e.g. the poem beginning "When I am dead, my dearest," are poignant in their sadness, none of them is morbid or gloomy, and flashes of lambent



Rosberg, Switzerland. Village of Arth at the foot of the mountain Frith

point is Wildspitz, 5,190 ft. A road leads to the summit from Unter-Aegeri, a bridle path from Steinerberg, and a footpath from Sattel station on the Rothenthurm line. From it descended the landslide of 1806, a disaster which buried four villages and 457 people.

Ross Castle. Ancient tower or keep on Ross Island, Killarney, Eire. Built in the late 14th century, a stronghold of O'Donoghue Ross, head of clan under MacCarthy More, it was granted in

fancy recall a spirit that bore physical and mental trial with steady fortitude and abiding cheerfulness. Dr. Richard Garnett justly compared the imaginative quality of *Goblin Market* with *The Ancient Mariner*, and declared its insight Shakespearean. With *Goblin Market* may be recalled *The Prince's Progress*, *Monna Innominata*: a Sonnet of Sonnets, *Amor Mundi*, *Vanity of Vanities*, *Looking Forward*, and *The Convent Threshold*. (Christina Rossetti's work, remarkable for its simplicity, purity, and flexibility, possesses qualities that must always appeal to the sorrowful and afflicted. See *Poetical Works of C.R.*, with *Memoir and Notes*, W. M. Rossetti, 1904; *Lives*, Proctor, 1896; *Mackenzie Bell*, 1898; *Stuart*, 1930; *Sanders*, 1930; *The Family Letters of C.R.*, ed. W. M. Rossetti, 1908.

Rossetti, DANTE GABRIEL (1828-82). British poet and painter, whose full name was Gabriel Charles Dante Rossetti. Born at Charlotte Street, Portland Place, London, May 12, 1828, he was the eldest son of Gabriele and Frances Mary Rossetti, refugees from Naples. His father was professor of Italian at King's College, London, at the school attached to which Dante Rossetti was educated. He studied drawing under J. S. Cotman, and entered Cary's Academy in Bloomsbury, 1842, and the R.A. schools, 1846. His literary power developed in advance of his painting; *The Blessed Damozel* and several sonnets were composed about 1847. In 1848, however, he became the pupil of Ford Madox Brown, a step which led to his acquaintance with Holman Hunt and Millais, and incidentally to the formation of the Pre-Raphaelite Brotherhood. About 1852 he became engaged to Elizabeth Eleanor Siddal, the model for his *Beatrices* and of Millais's *Ophelia*. In 1855 he made the acquaintance of William Morris and Burne-Jones, and two years later took a leading part in the decoration of the Oxford Union, contributing *The Vision of Lancelot*. In 1860 he married Miss Siddal, but she died in 1862, and in 1867 his own health began to give way. He increased his nervous malady with doses of chloral, and, after an attempt to poison

himself with laudanum, 1872, and going through a severe illness in 1877, he was seized with partial paralysis in 1881, and died at Birchington, April 9, 1882.

Rossetti ranks higher as a poet than as a painter; the technicalities of the latter art presented difficulties which he evaded rather than grappled with. But inasmuch as his painting is the vehicle for the expression of his sensuous emotions, he is the true if not perfect artist in this, as in his other sphere of activity. His best known pictures are: *Ecce Ancilla Domini*, 1850 (Tate Gallery); *Meeting of Dante and Beatrice*, 1851; *The*



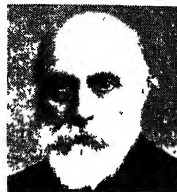
Self-portrait

Annunciation, 1855; *My Lady Greensleeves*, 1858; *Beata Beatrice*, 1863; *The Beloved*, *Monna Vanna*, and *Sibylla Palmifera*, 1866; *Pandora*, 1871; *The Blessed Damozel*, 1874; *Fiammetta*, 1878; and *Dante's Dream*, 1881 (Walker Art Gallery, Liverpool). Conspicuous among his writings are his translations of Early Italian Poets, published with Ruskin's financial help in 1861, and the two volumes of *Ballads and Sonnets*, issued in 1870 and 1880. See *Pre-Raphaelites*.

Bibliography. *Collected Works*, ed. with preface and notes by W. M. Rossetti, 1890; *Rossetti as Designer and Writer*, W. M. Rossetti, 1889; *Rossetti: His Family Letters*, with *Memoir* by W. M. Rossetti, 2 vols., 1895; *Lives*, Hall Caine, 1882; W. Sharp, 1887; J. Knight, 1887; F. G. Stephens, 1894; H. C. Marillier, 1899, 3rd ed. 1904; A. C. Benson, 1904; *Three Rossettis*, ed. J. C. Troxell, 1930; *The Rossettis and their Circle*, V. Hunt, 1936; *Gabriel Rossetti in England*, E. R. Vincent, 1936; *The Pre-Raphaelite Tragedy*, W. Gaunt, 1942.

Rossetti, WILLIAM MICHAEL (1829-1919). British man of letters. Born Sept. 15, 1829, the

second son of Gabriele Rossetti and brother of Dante Gabriel and Christina, he was educated at a private school and at King's College, London, becoming a clerk in the civil service in 1844. In 1869 he became assistant secretary of inland revenue, and he retired in



W. M. Rossetti, British man of letters
Russell

the artistic and literary tastes which he shared with his brother and sisters. He was a member of the original Pre-Raphaelite Brotherhood, recording in his diary its proceedings, and editing *The Germ* (q.v.). His translation of *Dante's Hell*, 1865, was closely followed by *Fine Art*, Chiefly Contemporary, 1867; he wrote a *Life of Keats*, 1887, edited Chaucer and Shelley, William Blake and John Ruskin; wrote on the Pre-Raphaelites, and contributed on art to *The Critic* and *The Spectator*.

Rossetti's copious work, both as editor and memorialist, on his own family, including a *Memoir of his brother*, 1895, and a reprint of his father's autobiography, is illuminating. He died Feb. 5, 1919.

Rossi, FRANCESCO DEI (1510-63). Italian painter, known as Il Salviati. Born at Florence, he studied under Andrea del Sarto and Baccio Bandinelli. He worked at Rome for Cardinal Salviati, his principal patron; at Venice, Florence, and in France, at the château of Fontainebleau. An erratic and reckless disposition prevented his taking advantage of great opportunities. He died of fever at Rome. Two examples of his work are to be seen in the National Gallery, London.

Rossi, GIOVANNI BATTISTA DEI (1494-1541). Italian painter, commonly known as Il Rosso, and Maître Roux. Born at Florence, he evolved an inventive and original style from the study of Michelangelo and Parmigiano. From Florence he went to Rome, where he had a good reputation. When the town was sacked in 1527, he escaped to Volterra, then made his way to France, where he designed the great gallery at the château of Fontainebleau, and painted a series of frescoes illustrative of the life of Francis I. A charge of theft which in a hasty moment he brought against his friend Pellegrini led to the latter being put to the torture before



Elizabeth Rossetti
After D. G. Rossetti

being declared innocent, and this event so preyed upon Rossi's mind that he committed suicide.

Rossi, LUIGI DE (b. c. 1600). Italian composer. He was born in Naples. His opera *Le Mariage d'Orphée et d'Euridice*, 1647, was the first Italian opera given in Paris.

Rossi, COUNT PELLEGRINO LUIGI EDOARDO (1787-1848). Italian economist and statesman. Born at Carrara, July 13, 1787, he was educated at Pavia and Bologna. In 1815 he supported Murat, and on the latter's fall went to Geneva where he lectured on Roman law. He was made a citizen of Geneva because of his services to jurisprudence. Later he went to France, where he became professor of political economy at the Collège de France, 1833. Naturalised a Frenchman in 1834, he was made a peer in 1839, and became doyen of the faculty of law in Paris in 1843. Ambassador of France to Rome during 1845-48, he then became minister of the interior under Pius IX, but was assassinated Nov. 15, 1848, because of his opposition to union with Savoy.

Ross Ice Shelf. The largest of the Antarctic ice-shelves. It is roughly triangular in shape with its base on the 400-mile long Ross ice barrier which stretches from Marie Byrd Land to South Victoria Land in about 77° S., and its apex at Thorne Glacier, some 180 miles from the S. pole; its area is estimated at 160,000 sq. m. Having a comparatively smooth surface, it formed the most convenient road of approach for expeditions aiming to reach the South pole overland, and this route was used by Amundsen, Scott, Shackleton, and Byrd. Together with the Ross ice barrier it is sometimes known as the Great Ice Barrier. *See* Antarctic Exploration; Ice-shelf; Ross Sea.

Rossignol. Lake on E. half of the peninsula of Nova Scotia, Canada. The largest lake (21 m. by 8 m.) in the prov., it drains by the Liverpool river to the Atlantic.

Rossini, GIOACHINO ANTONIO (1792-1868). Italian composer. Born at Pescara, Feb. 29, 1792, he



studied composition and cello playing at Bologna, 1807, and produced his first opera, *La Camicia di Matrimonio*, 1810. His success was instant, and several light pieces followed, Tancred being produced at Venice in 1813. The Barber of Seville appeared at Rome, 1816, and became universally popular. Rossini composed twenty operas between 1815-23, these including *Otello*, 1816, *La Gazza Ladra*, 1817, *La Donna del Lago*, 1819, and *Semiramide*, 1823, as well as several cantatas, visited England, 1823, and settled for a time in Paris, where *William Tell*, his last opera, was produced in 1829. His famous *Stabat Mater* was written in 1832 and 1841, and first sung as a whole in 1842. After living in Bologna and Florence, 1837-55, he settled in Paris, but wrote little save church music and piano-pieces, dying Nov. 13, 1868.

Rossini had a great gift of flowing melody, and his work is highly characteristic of the Italian tradition. There is much that is turgid and cloying in his writing, but the best of it, such as *The Barber of Seville*, has unfailing freshness and charm. *See* Opera. *Consult* Rossini and *Some Forgotten Nightingales*, Lord Derwent, 1934; Rossini, F. Toye, 1934. *Prom. Rossee-nee*.

Rossland. Town of British Columbia, Canada. In the Kootenay dist., it is only 6 m. from the U.S. boundary and is served by the C.P.R. It is a centre of the W. Kootenay mining district, and was made a town in 1897. Pop. 3,890.

Rosslare. Seaport of co. Wexford, Eire. It is 6 m. from Wexford, and is served by the Eire state rlys. From its settlement by King John in 1210 to the founding

of the Irish Free State in 1921 successive rebellions against English authority occurred in the neighbourhood. Formerly only a fishing village and a coastguard station, with an old church, it came into use as a port in 1906, when the harbour was reconstructed to serve as a terminus for the route from Fishguard which was opened by the G.W. rly. in connexion with the then G.S. & W. line. Pop. 670.

Rosslyn, EARL OF. Scottish title borne by the family of Erskine. In 1801 the lawyer, Alexander Wedderburn (v.i.) was made earl of Rosslyn, a title which passed on his death, in 1805, to his nephew, James St. Clare Erskine (1762-1837), son of Sir Henry Erskine, Bart. He was an M.P., 1782-1805, and was a Tory minister under Wellington and Peel, being lord privy seal, 1829-30, and lord president of the council, 1834-35. His descendant, Anthony Hugh Francis (b. May 18, 1917) became the 6th earl in 1939. The earl's eldest son is known as Lord Loughborough. *See* Roslin.

Rosslyn, ALEXANDER WEDDERBURN, 1ST EARL OF (1733-1805). British judge, better known as Lord Loughborough. Born in Edinburgh, Feb. 13, 1733, the son of a Scottish lord of session, he was educated at Dalkeith and Edinburgh university. He became a



1st Earl of Rosslyn,
British judge
After Reynolds

Scottish advocate in 1754, but was called to the English bar at the Inner Temple, 1757. He was M.P. for Ayr burghs, 1761, and for Richmond, Yorks, 1768, and then joining the Whigs, sat for Bishop's Castle, 1769-74 and 1778-80. After violently attacking Lord North, he suddenly returned to the Tory party. He was made solicitor-general, 1771, attorney-general, 1778, chief justice of the court of common pleas and Baron Loughborough, 1780, and lord chancellor, 1793-1801, being on his resignation created earl of Rosslyn. He died Jan. 2, 1805, near Windsor, and was buried in S. Paul's Cathedral. An unscrupulous time-server, he punished seditious sympathisers with the French Revolution with great rigour.

Ross Sea. Part of the Arctic Ocean, lying between South Victoria Land and King Edward VII Land. It contains Ross Island,



Rosslare, Eire. Harbour and quays for the railway steamboat service from Fishguard, Pembrokeshire

and is blocked to the S. by the Ross Ice Shelf (*g.v.*). During summer it is usually free from ice, and thus formed a convenient entrance for the explorers of Antarctica. Scott and Amundsen both used its S. shore as a base. Sir J. C. Ross, when he led the expedition of the Erebus and Terror to the Antarctic in 1839-43, reached lat. 78° 10' S. Its coasts, with adjacent islands and territories, were annexed to New Zealand in 1923. See Antarctic Exploration.

Rostand, EDMOND (1868-1918). French poet and dramatist. Born at Marseilles, April 1, 1868, his



Edmond Rostand,
French poet

earliest play, *Le Gant Rouge*, was a failure, but in 1894 *Les Romanesques*, produced in England as *The Fantasticks*, made it clear that a writer had arisen who might restore the poetic drama to the French stage; the possibility seemed assured with the success of *La Princesse Lointaine* in 1895. In 1897 came Rostand's great triumph with *Cyrano de Bergerac*, which gave the author a world-wide success. *L'Aiglon* followed in 1900, and in 1901 the author was elected to the French Academy. In 1910 came, after various delays, *Le Chanteur*, the characters of which were the cock and other inhabitants of the farmyard. *Les Musardises*, a collection of his early poems, was pub. in 1911. Rostand died in Paris, Dec. 2, 1918. See *Bergerac*, *Cyrano de Bergerac*, *Edmond Rostand*, *J. Haraszti*, 1913; *Le Théâtre d'Edmond Rostand*, J. Suberville, 1919; *La Vie Profonde d'Edmond Rostand*, P. Apesteegny, 1929.

Rostock. City of E. Germany, in the *Land*, former free state, earlier grand duchy, of Mecklenburg. On the left bank of the navigable R. Warnow, which leads 6 m. N. to the port and seaside resort of Warnemünde (incorporated with the city) on the Baltic, Rostock contained monuments of outstanding historic importance. Among its churches were those of S. Mary (13th-15th centuries); S. Nicolas (early 14th century); S. Peter (early 15th century) with a tower 402 ft. high, and S. James's (15th century). The Gothic town hall dated from the 14th century and had an annex in the Baroque style. The university, oldest in N. Germany, was founded in 1419, and

contained a library of more than 500,000 vols. There were several museums, a teachers' academy, schools, and colleges. It was the birthplace of Blücher.

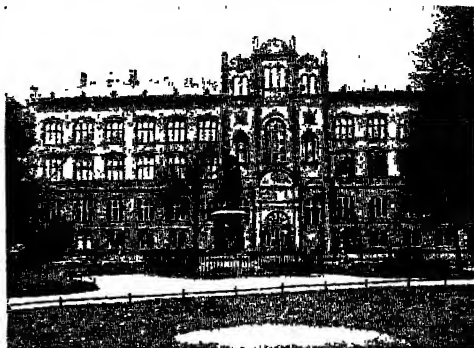
Of considerable importance industrially, the commercial area contained the Neptun shipyards, the Heinkel aircraft works, engineering and chemical factories. The port received and dispatched between 1,100 and 1,200 ships annually. Rostock was also a naval base, an important rly. junction, and an airport.

Originally a Wendish settlement, destroyed by the Danes in 1160, the city obtained urban rights in 1218. It fell to the Mecklenburg dynasty in 1352, was a leading member of the Hanseatic league in the 14th century, and later was frequently the residence of the dukes, though in conflict with them for centuries. Pop. (1950) 120,000.

By reason of its military and industrial significance, it was a target for air attack during the Second Great War, the R.A.F. bombing it on four consecutive nights, April 23-26, 1942, in the heaviest raids to that date. Rostock and Warnemünde were captured May 2, 1945, by Rokossovsky's 2nd White Russian army and lay after Germany's surrender in the Russian zone of occupation.

Rostopchine, FREDOR VASILIEVITCH, COUNT (1763-1826). Russian soldier. He was born March 23, 1763, and entered the army. After holding various military and civil offices, and winning the favour of Paul I, he was appointed in 1812 governor-general of Moscow, in which capacity he was publicly charged with having set fire to the city when the French occupied it. In 1823 he issued a vindication of himself entitled *The Truth About the Burning of Moscow*, but afterwards recanted a good deal of his denial. He attended the congress of Vienna, but soon retired. He died in Moscow, Feb. 12, 1826.

Rostov. Town of the R.S.F.S.R., in Yaroslav region. It lies 35 m. S.W. of Yaroslav, on Lake Rostov or Nero, and the Moscow-Yaroslav rly. It is also known as Rostov Velikiy or Great Rostov. One of



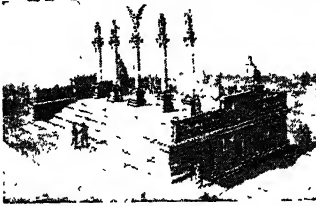
Rostock, Germany. University buildings with statue of Blücher in the foreground. Photographed before the destructive air raids in 1942

the most ancient of Russian towns, it was founded by the Slavs about 862, and is famous for its antiquities, chief of which are the Kremlin, and the Uspenski cathedral. It was formerly noted for the manufacture of ikons. Under the Soviet regime it developed rapidly; its industries include drying of vegetables, preparation of coffee and chicory, and flour milling. It was beyond the area invaded by Germany in the Second Great War.

Rostov-on-Don. City and port of Azov Black Sea area, R.S.F.S.R. It lies E. of the sea of Azov at the head of the Don delta. Before the Second Great War it was a centre of the grain trade, exporting wheat, rye, and barley, as well as wool, and an industrial centre with ship-building yards, its industries including heavy engineering and the making of agricultural machinery; there were extensive flour mills, iron works, tobacco, boot and shoe, zinc, and dyeing factories. Linked by rly. with the Volga and the Caspian Sea, it was an important junction, and in 1939 was the tenth city of the U.S.S.R. Pop. (1939) 510,253.

During the Second Great War it was the scene of violent fighting. German forces broke into the city, Nov. 22, 1941, when house-to-house fighting ensued. The Russians withdrew, leaving nothing of value; Timoshenko delivered a counter-attack that regained the city Nov. 28. The German retreat from Rostov was Hitler's first major reverse. After savage fighting the city was again evacuated by the Russians, July 27, 1942, during the German drive to the Volga and Caucasia. The battered shell of the city was recovered after several days' house and street fighting which terminated on Feb. 14, 1943, Cossack Guards completing its liberation.

Rostrum. In modern usage, any raised platform from which a speaker addresses an audience.



Rostrum. Reconstruction of the rostrum in the Forum of ancient Rome

In ancient Rome, only in the plural form, *rostra*, the word was used to indicate the tribunal or platform in the Forum. From it magistrates addressed the assembly of the people. It was so named because it was ornamented with the beaks or rams (*rostra*) of ships captured from the enemy in naval battles. See Forum; Rome.

Rosyth. British naval base on the firth of Forth 11 m. N.W. of Edinburgh, Scotland. Construction of Rosyth began in 1909 and was completed in 1916. The main basin, covering an area of 55 acres, is enclosed by a sea wall and entered through a lock. The largest warships can pass in and out at all states of the tide. There are three dry docks, and workshops, stores, and fuel installations for the repair and maintenance of all classes of warships. A garden city was built to house the civilian workers. In the First Great War Rosyth was the chief British naval base on the E. coast and the h.q. of the cruiser squadrons.

In 1925 Rosyth was reduced to a care and maintenance basis, but was reopened in 1939 to meet operational requirements of the Second Great War. It was the main port of assembly for the Norwegian expedition, April, 1940, when more than 1,200 vessels were armed and supplied with stores and equipment. All battle-ships of the King George V class and many fleet aircraft carriers completed their fitting-out there.

Rotary International. Movement among business men which takes for its motto "Service, not

self." The idea originated with Paul Harris, a Chicago lawyer, who in 1905 sought to establish a little club of men, each representing a different trade or profession,

for the interchange of opinion on business and other matters. Religion and politics were excluded from discussion.

The first Rotary Club was a uncheon club, but in a few years the number of Rotary Clubs was 200, and in 1911 the institution took root in Great Britain. Rotarians gradually evolved an ethic of their own, founded on their motto, "Service, not self," and are establishing a kind of modern Freemasonry, without its formalities and secrecy.

Rotarians, as they are called, hold a convention every year. The international headquarters are in Chicago. The governing body in the U.K. formerly called the British Association of Rotary Clubs, is now the Rotary International in Britain and Ireland, and has offices at Tavistock House, London, W.C.1.



Roten Turm. Shattered tower on the roadway through the pass in the Transylvanian Alps

Rotation. Action of moving round a centre or of turning round an axis. The axis round which a body revolves is called the instantaneous axis of rotation. Rotation may also be defined as the change of direction of a vector (*q.r.*). For the rotation of a bullet when fired from a rifled barrel see Ammunition. In plants the flowing of protoplasm within the cell wall is called rotation. Any return or succession in a series is also called a rotation, e.g. rotation of the seasons.

Rotation of Crops. Term used in agriculture for the system by which selected crops are grown in sequence on any one field. Its primary aim is to prevent the excessive drain on particular mineral nutrients in the soil which occurs when one kind of plant is grown on the same piece of land year after year. Since different plants tend to denude the soil of different nutrients, intervals between crops of similar plants allow time for the soil to undergo a natural process of recovery. Leguminous plants are valuable in a rotation since the bacteria in their

root nodules fix atmospheric nitrogen, and when the residues are ploughed in nitrogen content is increased. Shallow-rooted plants, such as barley, often follow deep-rooted ones, such as mangold, so that different layers of the soil are utilised. Crops used for human food usually alternate with those used as cattle food, so that ample manure is made available. Plants liable to attack by the same pests are separated in the sequence in order to reduce the likelihood of attack, and crops which can be weeded are intercalated among those which cannot. Farming operations necessary for various crops differ and are carried out at different seasons; rotation thus facilitates spreading the work over the year. See Ley Farming.

Roten Turm OR **ROTER TURM.** Pass in the Transylvanian Alps. It is 17 m. S. of Sibiu (Hermann-

stadt). The river Oltu has cut its way from S. Transylvania through the mountains, which are the S. section of the Carpathians, to the plains of Wallachia. The rly. follows the river gap, which is overlooked by the peak Negoi, 8,320 ft., to the E. The road follows easier but more elevated ground W. of the gap. The square Red Tower, from which the pass takes its name, was built in 1533 at the S. end. See Carpathians; Rumania: Conquest of.

Rotha, PAUL (b. 1907). British film director and writer. Born June 3, 1907, and educated at Highgate, and the Slade school, he became art critic to The Connoisseur during 1927-28, and during the 1930s directed documentary films for the Empire Marketing Board, Shell-Mex, and important industrial concerns. He formed his own companies in 1941 and 1944. He made such noteworthy films as The Face of Britain, The World is Rich, Land of Promise, A City Speaks, Today We Live, The Fourth Estate. He wrote much on film



Rotary International badge

technique and the history of the cinema, his books including *The Film Till Now*, 1930; *The Film Today*, 1931; *Documentary Film*, 1935; *Movie Parade*, 1936.

Rothamsted. Pioneer agricultural experimental station, near Harpenden, Herts. It was founded



Rothenburg, Bavaria. Siebersturm, a gate in the old city wall

by John Bennet Lawes (*q.v.*) in 1843, and endowed by him in 1889. With him from the first was associated Joseph Henry Gilbert (*q.v.*), and the two worked together until the death of Lawes in 1900. From the date of foundation until the present time a continuous series of most important researches has been carried out on the 500-acre Rothamsted estate and in the attached laboratories.

The personal experimental work of Lawes began when he succeeded to the estate in 1834, and led to the discovery of superphosphate. Wheat has been grown continuously on the Broadbalk field from 1843, and experiments have been made on different manures, including the question of loss in drainage water. It has been proved that this deep-rooted crop needs less manure than some others, and is particularly benefited by the action of nitrate of soda. Similar experiments have been carried out on barley, oats, root crops, etc. The classical experiments provided a broad basis for the effective use of fertilisers. Later came long-period experiments on rotation of crops, soil husbandry, and plant diseases. Consult the station's annual reports.

Rothbury. Urban district and market town of Northumberland, England. It stands on the Coquet 11 m. by rly. S.W. of Alnwick. Situated amid wild moorland scenery, it attracts many visitors. All Saints church is an old cruciform building restored. Rothbury has been in the possession of the Percys for 600 years. Near is Craggside, the residence erected

by the 1st Lord Armstrong. Market day, Mon. (alternate). Pop. 1,255.

Rothenburg. Name of several German towns, the most famous of which is Rothenburg ob der Tauber, 40 m. W. of Nuremberg. It is known all over the world as a perfectly preserved medieval town. It is situated on a height above the Tauber, 1,312 ft. above sea-level, and is surrounded by a wall built in the 14th and 15th centuries. There are a number of 16th century houses, and many fine churches, notably that of S. James (1393-1598) and that of

S. John (1393-1403). The town hall, which is richly decorated, is part Gothic, part Renaissance (13th and 16th century). There is a small spa, and some local industry. Known from the 10th century, Rothenburg became a town, 1172, was independent c. 1400, and was eventually incorporated in Bavaria in 1802. Overrun by U.S. forces in April, 1945, during the Second Great War, it escaped serious damage; after Germany's surrender it was in the U.S. zone of occupation. Pop. (1950) 11,200.

Rotenone. Colourless crystalline substance, formerly known as tubatoxin, contained to the extent of up to 10 p.c. in the Malayan plant *Derris elliptica*, but is probably present in other species of the genus. Rotenone, which is almost insoluble in water but soluble in some organic solvents, has been made synthetically. It is used as an insecticide, being extremely poisonous to insects, but only slightly toxic to mammals. The original use of derris root was as the source of a fish poison used by natives in the tropics. See *Derris*.

Rothenstein, JOHN KNEWSTUB MAURICE (b. 1901). British art director and writer. Son of Sir W. Rothenstein (*v.i.*), he was born July 10, 1901, and educated at Bedales school, Worcester College, Oxford, and London university. Assistant professor of art history at Kentucky university, U.S.A., 1927-28, and at Pittsburgh, 1928-29, he was director of the art galleries of Leeds, 1932-34, and Sheffield, 1932-38, after which he was, appointed director of the Tate

Gallery. His publications included *The Portrait Drawings of William*



John Rothenstein, British art director

Rothenstein, 1926; *19th Century Painting*, 1932; *Foreign Pictures in the Tate Gallery*, 1947. He wrote also biographies and critical appreciations of Conder, 1938; Augustus John, 1944; Edward Burra, 1945; and Manet, 1945, and edited the Phaidon edition of *British Artists*. He contributed to this Encyclopedia the entry on *Contemporary Painting*.

Rothenstein, SIR WILLIAM (1872-1945). British artist and art teacher. Born of Jewish stock at Bradford, Yorks, Jan. 29, 1872, he was educated at Bradford grammar school, and studied art at the Slade school under Legros, and in Paris under Constant. He became acquainted with most of the celebrated painters and writers of the day, and made his reputation as a painter with *The Doll's House*, now in the Tate Gallery. A notable series of Jewish studies was begun in 1904 with *The Talmud School* (1904), culminating in *Jews Mourning in the Synagogue* (1906). But he was chiefly famous for his many portraits, in pencil and chalk, of celebrities over a period of 50 years, which made him the Holbein of his time. These were not only examples of strong, sound draughtsmanship but an invaluable record. Thirty of the drawings were purchased for the National Portrait Gallery in 1935. During the Second Great War he drew over 200 portraits of airmen, exhibited in London in 1942.



Sir W. Rothenstein, British artist Russell

Rothenstein was professor of civic art at Sheffield University, 1917-26; principal of the Royal College of Art, 1920-35; Romanes lecturer, Oxford university, 1934. During 1931-38 he was a member of the Royal Fine Arts commission. Knighted in 1931, he published three vols. of *Memoirs*, 1931, 1932, and 1939. Other published volumes included *Twelve Portraits*, 1929; *Twenty-Four Portrait Drawings*, 1937. He died Feb. 14, 1945.

A description of Rothenstein as a young man is included in Max Beerbohm's *Seven Men*.

Rotherham. County and mun. borough and market town of the W. Riding of Yorks, England. It stands at the junction of the Rother and Don, 6 m. by rly. N.W. of Sheffield. The chief buildings are the fine cruciform church of All Saints, a Perpendicular edifice of

the 15th century, town hall, grammar school, etc. The main industries are ironworks, brassworks, and the like; there are also sawmills, works for making glass and chemicals, and it is a railway centre. On the old bridge across the Don are the remains of a chapel. In A.D. 54 the Romans built a bridge here. Rotherham existed in Anglo-Saxon times, but did not become a corporate town until

was a native; and Swift made it the birthplace of Lemuel Gulliver. Here the Fighting Téméraire was broken up in 1838. Jacob's Island was the scene of Bill Sikes's death in Dickens's *Oliver Twist*. See *Bermondsey*; *London*.

Rothermere OF HEMSTED, HAROLD SIDNEY HARMSWORTH, 1st Viscount (1868-1940). British newspaper owner. He was born at Hampstead, London, April 26, 1868. The younger brother of Viscount Northcliffe (*q.v.*), he entered his brother's publishing business at the age of 21, and was thenceforth for many years intimately associated in his great successes, founding with him the Amalgamated Press, reorganizing the London Evening News, and establishing the Daily Mail, the Daily Mirror, and the Anglo-Newfoundland Development Co.

In 1910 he founded and endowed with £20,000 a professorship of English Literature at Cambridge university in memory of King Edward VII. That same year he was created a baronet. He was raised to the peerage as Baron Rothermere in 1914, and in that year acquired from his brother sole control of the Daily Mirror. In 1915 he founded the Sunday Pictorial (*q.v.*), in 1922 acquired the Daily Mail, which he had relinquished in 1910, and in 1923 most of the publications of Sir E. Hulton, which were later sold to Lords Camrose and Kemsley.

He held government office in the First Great War, becoming in 1917 air minister, at Mr. Lloyd George's invitation, for the purpose of amalgamating the Royal Flying Corps and the Royal Naval Air Service. He resigned in 1918 as the result of ill-health, receiving a viscounty in 1919. After the war he conducted an energetic campaign in his newspapers for economy, writing many articles himself.

He died in Bermuda, Nov. 26, 1940, and was succeeded by his third son, Esmond Cecil (b. May 26, 1898), whose two elder brothers had been killed in the First Great War. The 2nd viscount was educated at Eton, and was M.P. for Thanet, 1919-29. He joined the board of Associated Newspapers in 1923, becoming vice-chairman in 1927 and chairman in 1932. He also held directorships of several film companies.

Roths. Police burgh of Morayshire, Scotland. It is near the river Spey, 10 m. from Elgin, and has a rly. station. Distilling is the main industry. There are remains of a castle which was formerly a seat of the Leslie family. Pop. est. 2,000.

Roths, EARL OF. Scottish title borne by the family of Leslie since 1457, or earlier. The 1st earl was George Leslie, who had estates in Fife. The 3rd earl was killed at Flodden. John, 7th earl, became lord chancellor of Scotland after the Restoration, and was made a duke in 1680. He died without sons in 1681, when his daughter



2nd Viscount Rothermere, British newspaper director



Rothermere



Roths arms



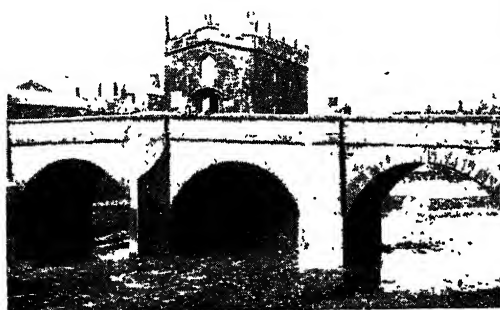
1st Duke of Rothés, Scottish royalist After Lely

obtained in 1663, re-granting the earldom, the estates having been sequestered in 1651. When the countess Mary, wife of Martin E. Haworth-Leslie, died in 1893, the titles passed to her grandson, who became 19th earl. Malcolm, 20th earl (b. Feb. 8, 1902), succeeded in 1927. His seat is Garstons, Wilts, and his eldest son is called Lord Leslie. *Pron. Roth-éz.*

Rothesay. Royal and mun. burgh and watering-place of Bute-shire, Scotland, also the county town. It stands at the head of Rothesay Bay, a fine opening of the sea, on the E. side of the



Rotherham arms



Rotherham, Yorkshire. Old bridge, with remains of chapel

1871. Since 1918 it has sent one member to parliament. Market days, Mon. and Sat. Pop. 80,890.

Rotherhithe. London district. A parish and division of the met. borough of Bermondsey, served by the British rlys. (S. section) and the Metropolitan line, it includes the Surrey Commercial docks (*q.v.*), and Southwark Park, 63 acres, which was opened to the public in 1869. The parish church of S. Mary, on the W. side of the entrance to the Thames Tunnel (*q.v.*), was rebuilt in 1715. Rotherhithe Tunnel, for foot passengers and vehicular traffic, connecting Jamaica Road, Rotherhithe, with Commercial Road, Stepney, is 1 m. 440 yds. long, 510 yds. being under the Thames, and was opened June 12, 1908.

Once part of the royal manor of Bermondsey, Rotherhithe was also known in the 17th century as Redriff. Admiral Sir John Leake

Isle of Bute. It is 40 m. W. of Glasgow, with a good modern harbour and pier. Rothsay is a



Rothsay arms

popular holiday centre. The chief building is the castle, restored by the marquess of Bute in 1871-77. Other buildings include those for town and county business, churches, schools, the Norman Stewart institute, and a museum. There are parks, tennis courts, golf and putting courses, and baths, while yachts and steamers



Rothsay, Scotland. Town and harbour from Chapel Hill

frequent the harbour. Rothsay was made a royal burgh in 1400, the castle, now the property of the burgh, being then a royal residence. Pop. 9,346.

Rothsay, DUKE OF. Scottish title borne by an heir-apparent to the British throne. It was created in 1398 for David, eldest son of Robert III, king of Scotland. He had previously been earl of Carrick. In 1399, owing to the illness of his father, he was made regent, but was soon superseded, and imprisoned in Falkland by his uncle, the duke of Albany. On March 27, 1402, he died there, it is said, of starvation. The title became one of those borne by the heir to the Scottish and in later years to the British throne.

Rothhorn, BRIENZER. Mountain mass of Switzerland. On the borders of the cantons of Berne, Lucerne, and Unterwalden, it attains an elevation of 7,715 ft., and the summit is reached by a rack and pinion rly. from Brienz (*q.v.*).

Rothley Temple. Elizabethan mansion in Leicestershire, England. It contains the chapel of a preceptory of the Knights Templars, is 5 m. N. of Leicester, and was the birthplace of Lord Macaulay. The parish of Rothley lies on the edge of Charnwood Forest, having a rly. station and a pop. of 2,734. See Macaulay.

Rothschild. Name of a family of Jewish financiers. They derive their name from the sign of the red shield (Ger. *roth Schild*) by which their house at Frankfort was known. The family was founded by Mayer Anselm Rothschild (1743-1812), a banker and money changer of Frankfort who made a fortune by providing the sinews of war for the anti-French party during the campaigns in Spain and Germany. His five sons, who were all made Austrian barons in 1822, extended the business through Europe. Anselm (1773-1855) continued at Frankfort, Solomon (1774-1855) went to Vienna,

Nathan Mayer (1777-1836) went to Manchester in 1798 and moved to London in 1805, Karl (1788-1855) set up in Naples, and Jacob (1792-1868) operated in Paris.

Nathan Rothschild in London made a large fortune by his financial activities, in which he assisted the British and other European governments. His eldest son, Lionel (1808-79), was best known by his labours for Jewish emancipation; elected M.P. for the City of London in 1847, he was allowed to sit, as a Jew, in 1858. A second son, Anthony (1810-76), a London banker, was created a baronet in 1847. Lionel's son, Nathaniel Mayer (1840-1915), was M.P. for Aylesbury from 1865 to 1883, when he was made a baron of the U.K. An ardent philanthropist, he was president of the British Red Cross Society when he died, March 31, 1915.

Nathaniel Mayer Victor (b. 1910), 3rd baron, grandson of the 1st baron, was born Oct. 31, 1910, and educated at Harrow and Trinity College, Cambridge. He engaged in research in biophysics until 1939, but during the Second Great War was in charge of counter-sabotage for the British and U.S. military authorities. He succeeded to the title in 1937.

James A. de Rothschild, son of Baron Edmond de Rothschild of

the French branch was educated at Lycée Louis le Grand, Paris, and Trinity College, Cambridge. He was Liberal M.P. for Isle of Ely, 1929-45, and joint parl. secretary at the ministry of Supply in 1945.

Another of the French branch was Baron Henri de Rothschild (1872-1947), great-grandson of Nathan Rothschild. Born July 26, 1872, he became a physician in Paris, where he founded a dispensary for treating children's diseases. He also wrote plays under the pseudonym André Pascal, *e.g.* *La Rampe*, 1909; *Le Grand Patron*, 1931; and built one of Europe's best equipped theatres, the Pigalle, Paris. He died Oct. 10, 1947. Consult *The House of Rothschild*, Count Corti, Eng. trans. 1928.

Rothwell. Urban district of Northants, England. It is 4 m. N.W. of Kettering and connected with it by rly. Boots, shoes, and clothing are manufactured. The chief buildings are the church of Holy Trinity in the Transitional style, with memorials to the Tresham family, and the market house, a Renaissance building which, begun by a Tresham in 1577, remained



in an unfinished condition until the 20th century. Pop. 4,516.

Rothwell. Urban dist. of the W. Riding of Yorks, England. It is 4 m. S.E. of Leeds. The chief church is Holy Trinity, a fine building which has been restored. The place has some



Rothschild. Prominent members of the family. 1. Mayer Anselm, 1743-1812. 2. Nathan Mayer, 1777-1836, founder of the English house, from an old print. 3. Lionel Nathan, 1808-79. 4. Nathaniel Mayer, 1st Baron, 1840-1915. 5. Lionel Walter (b. 1868), 2nd Baron

manufactures, while around are coal mines which provide employment for many. In the Middle Ages the family of Lacy built a castle here. Pop. 24,504.

Rotifera (Lat. *rota*, wheel; *ferre*, to bear). Large group of aquatic animals. It is regarded by most zoological authorities as constituting a separate phylum of the animal kingdom. The rapid movements of the cilia which surround the fore part of the body, when examined under a microscope, have the appearance of a revolving wheel. The creatures are all extremely small—the largest being just visible to the naked eye—and abundant in ponds, while a few species inhabit the sea. Some of them are fixed by stems to objects, and others swim freely. They consist of a body terminated anteriorly by a ciliated disk and posteriorly by a foot for attachment or a tail-like outgrowth. The transparency of the body usually allows the internal organs to be well seen. The alimentary canal consists of a tube passing to an anal aperture at the hinder end of the body, and it is partly armed with minute teeth which crush the food brought to the mouth by the action of the ring of cilia. This food consists of still more minute organisms and particles of vegetable matter.

The body cavity is filled with fluid in which the organs float, being more or less loosely attached by cells of connective tissue. In some species part of the oesophagus can be everted and the teeth brought to bear upon the algae on which the animal browses. There appears to be no definite respiratory system, but the organs are aerated by the diffusion of water through the body wall and its subsequent expulsion from a kind of bladder. It is remarkable that so lowly an organism should possess a bilobed brain, which often bears eyes. The sexes are separate, and the young are produced from eggs. In some species eggs are apparently produced parthenogenetically in summer, and are of two kinds—larger ones from which females are hatched, and small ones which result in males. In autumn the sexes pair and another type of eggs is produced. These have a thick shell and do not hatch out till the following spring.

About 700 species of rotifers are known, and several may usually be found by searching the weeds from any clear pond. They form interesting objects for examination

under the microscope, and some of their main features can be made out with a good pocket lens. One species, *Meliceria ringens*, builds a tube of minute balls of clay or of other matter that may be held in suspension in the water. Rotifers are grouped into four classes—those that live in tubes, those that creep like a leech, those that swim freely, and those that progress by leaps. See Animal. Consult The Rotifera, C. T. Hudson and P. H. Gosse, 1886; Rotifera, M. Hartog, Cambridge Natural History, vol. ii, 1896.

Rotomohana.

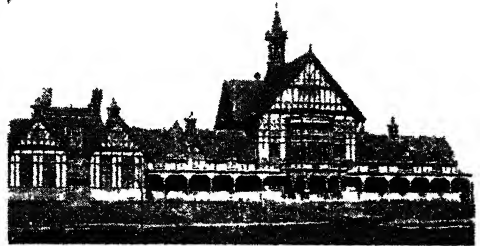
Lake of N. Island, New Zealand. On its shores until 1886 were hot springs and pink and white terraces of siliceous sinter of brilliant colour, the most beautiful of their kind in the world. They were destroyed by an eruption of Mt. Tarawera in 1886, and the lake is now a deep crater 2 sq. m. in area, in which a new warm lake has formed.

Rotor. Revolving portion of a machine. The term is most commonly applied to an electric generator or motor, where the rotor is the field magnet system of shaft, hub, magnet poles, field coils, and slip rings, the whole revolving inside a casing called the stator. That part of a turbine which carries the vanes and revolves is also called the rotor. A rotor ship is a vessel equipped with upright cylinders on the deck and having vanes; when the wind strikes the vanes, the rotor revolves and turns a propeller shaft. The first vessel of this type was built in Germany in 1929, but rotor-drive for ships was not successful, as speed is dependent upon wind. Later experiments converted the energy from the wind-driven rotors into electric power for charging batteries, which supplied power to motors driving the propeller shaft. Here the relays through which the power was obtained proved too complicated. The rotor arm of an internal-combustion engine revolves to make and break the ignition system and so convey to the sparking plugs in turn the correct firing order. Motor vehicles can be immobilised by removing the rotor arm; this had to be done in the U.K., under a defence regulation, during the

Second Great War if a vehicle was left unattended.

Rotorua. Lake of N. Island, New Zealand. Of volcanic origin, it is 20 m. N.W. of Mt. Tarawera, in the thermal spring region.

Rotorua. Town of N. Island, New Zealand. Near the lake of the same name, it is 171 m. by rail



Rotorua, New Zealand. Bath building at the Spa

S.E. of Auckland, in the midst of the 150-m. stretch of country of geysers, hot and cold lakes, fumaroles, etc., which make it one of the most wonderful natural features of the world. A Maori centre, it is owned and managed by the state as a health and tourist resort, within reach of fishing, deer stalking, and shooting of many kinds. Pop. 7,512.

Rotrou, JEAN DE (1609–50). French dramatist. The most important of the older contemporaries of Corneille, he was born at Dreux in Normandy, Aug. 21, 1609, and educated there and in Paris. He began by writing plays for various companies of actors; was for a time one of the five poets employed by Richelieu to carry out his dramatic ideas; and died, June 28, 1650, of the plague in Dreux, whither he went on learning that the mayor had fled from his post. His best work is to be found in his tragedies Saint-Genest and Venceslas.

Rotten Borough. Popular name given, in the early decades of the 19th century, to those English boroughs which, with populations reduced to a handful, retained the right of returning members to parliament. This anomaly, with many other abuses, was swept away by the Reform Act of 1832. See Borough; Commons, House of; Reform Act.

Rottenburg. Town of Württemberg, Germany. It stands at an alt. of 1,170 ft. above the Neckar, which separates it from the suburb of Ehingen, 6 m. S.W. of Tübingen. The buildings include the 15th century cathedral of S. Martin and the Bishophof, formerly a Jesuit convent.

The latter houses a museum, while another building contains a valuable collection of Roman antiquities found on the site of the Roman station of Sumelocenna. Around is an important hop-growing dist., and there are woollen and spinning factories, clockmaking and woodwork industries, and breweries. This place was added to Württemberg in 1805. After the surrender of Germany in 1945 it lay in the French zone of occupation. Pop. est. 7,600.

Rotten Row. London riding track, in Hyde Park (*q.v.*). It runs W. from Hyde Park Corner to Coalbrookdale Gate, and returns E. on the N. side of the carriage drive between Albert Gate and Alexandra Gate. The name is derived from the soft layer of tan which forms the surface, or, more probably, from *route du Roi*, a road kept sacred to royalty.

Rottenstone. Name given to a porous, friable, siliceous rock used largely for cleaning and polishing steel, brass, and other metals, and wood. The rock consists mainly of aluminium silicate and carbonaceous matter, and is a decomposed siliceous limestone. The best rottenstone is found in Derbyshire and S. Wales.

Rotterdam. City and seaport of the Netherlands, in the prov. of S. Holland. It lies on a section called the Maas of the Rhine-Maas delta, at a point where it is joined by a small river, the Rotte, 17 m. by rly.



Rotterdam arms

E. of the Hook of Holland, and 52½ m. by rly. S.S.W. of Amsterdam. The main part of the town, intersected by many quays and canals, is on the right bank; opposite lies the North Island, and the suburb of Feijenoord, with important harbours on the left bank. The long quay called the Boompjes (little trees) on the right bank was wrecked during the Second Great War.

Rotterdam, connected with the sea by the Nieuwe Waterweg, 1866-90, which admits large vessels from the Hook of Holland, before the Second Great War had a large transit trade to and from Germany, as well as its Dutch import and export trade. Imports include grain, metals, coal, petroleum, tobacco, coffee, rubber; about one-half of Dutch industrial exports pass through Rotterdam.

Shipbuilding with allied industries are of primary importance, and there are large manufactories of cigars, spirits, chemicals, cocoa, and sugar. The expansion of German overseas trade during the 19th and early 20th centuries greatly increased Rotterdam's transit trade. There are important steamship lines running to the Far East, the Americas, and Africa.

The Groote Kerk, or Church of S. Lawrence, begun in 1412, a large Gothic building, with unfinished tower, 1449-1651 (210 ft.), severely damaged in the Second Great War, stands at the edge of the central area of the city destroyed by the German air bombardment of May 14, 1940. The Exchange, 1772, with modern additions, and the Stadhuis or Town Hall, 1835, were destroyed in that raid, as were nearly all major business premises. The Boymans museum has a notable collection of Dutch paintings. Erasmus and Hendrik Tollens, the poet (1780-1856), were both natives of Rotterdam.

The city received its first municipal rights about the middle of the 14th century, but remained a place of minor importance until the mid-19th century. Pop. 660,000.

SECOND GREAT WAR. In the early hours of May 10, 1940, German troops landed at Rotterdam from transports which had made their way down the coast during the night, and established themselves in the port area. German parachutists seized the airport at Waalhaven, which the Dutch recaptured on May 11, only to lose it again as German reinforcements poured in. As in other places, the invaders received some assistance from fifth-columnists among the civilian population. German aircraft on May 14, without waiting for a reply to an ultimatum to surrender, bombed Rotterdam unopposed, the centre of the city being devastated (*see* illus. p. 6023) and thousands of people killed and injured. Under threat of similar attacks on other defenceless cities, the Netherlands army surrendered on the evening of the same day. During the German occupation of the Netherlands, Allied aircraft made frequent raids on the docks, oil depots, barge concentrations, and shipping at Rotterdam. On May 3, 1945, three British merchantmen, undersafe-conduct from the Germans, discharged cargoes of food and coal here for the starving population of the provs. of N. and S. Holland. The city was liberated only by the general German surrender on May 5. Navigation

of the Nieuwe Waterweg, blocked by demolitions and sunken shipping, was not restored until 1948.

Rotti. Island of Indonesia, lying off the S.W. of Timor. The people, chiefly Malays, produce rice, tobacco, sugar, cotton, soya beans, copra, and indigo. The only settlement of any size is Mokdale. Area, 653 sq. m. Pop. est. 70,000.

Rottingdean. Seaside village of Sussex, England. About 3½ m. E. and a suburb of Brighton, it is built in a valley of the South Downs. It contains a street of delightful old cottages, but during the 1930s many villas and blocks of flats were built close to the shore. S. Margaret's 13th century church was restored by Sir Gilbert Scott; it contains a stained glass window designed by Burne-Jones, who was buried here. The Elms, Rottingdean, was the home of Kipling for some years.

Rottlera (*Mallotus philippinensis*). Small tree of the Euphorbiaceae family. A native of tropical Asia, Malaya, and Australasia, it has large oval leaves, which are downy on the underside. The flowers have neither sepals nor petals, and are inconspicuous. The seed-capsule is three-lobed and coated with a red powder which has long been in use as a dye for silks. As kamala it has a place in the British Pharmacopoeia as a remedy for tape-worm. The Arabs also employ it in leprosy.

Rottweil. Town of Württemberg, Germany. On the Neckar, 68 m. S.S.W. of Stuttgart, it is a partially walled town of great antiquity. Within the town is the site of a Frankish camp, and ¼ m. S., in the village of Rottweil-Alstadt, are the remains of a Roman colony. The chief buildings are the 16th century town hall; the antiquarian museum; the chapel of S. Lawrence, c. 1579, which contains a collection of medieval pictures and wood-carvings, and a Roman mosaic pavement; and two churches, the Kapellen-kirche and the Heilige-Kreuz-kirche (13th-16th century). The former, built in the 14th-15th centuries and remodelled, 1721-29, has a lofty Gothic spire adorned with sculptures. Here was the main explosives factory of the German Dye Trust. There are also textile, ceramic, salt, and watch industries. After the Second Great War Rottweil was in the French zone of occupation. Pop. 10,856.

Rotuma. Small island of the S. Pacific Ocean. It lies about 250 m. N.N.W. of Fiji, to which it has belonged administratively since 1880.

Copra is the chief export. The principal settlement is Fangwot. The island is the seat of a British commissioner. Pop. 3,250.

Roualt, JOACHIM (d. 1478). French soldier. In the service of the dauphin (Louis IX), he fought in the Swiss and English campaigns of 1444 and 1448, and distinguished himself in many subsequent wars, becoming marshal of France in 1461. Ten years later he was made governor of Paris, and he fought against Charles the Bold.

Rouault, GEORGES (b. 1871). French painter. Born in Paris, May 27, 1871, he was apprenticed to a painter of stained glass and later studied under Moreau at the Beaux-Arts. The work of this most original artist was imbued with a deeply religious feeling, and his tragic tone combined with romanticism and absence of satire placed him in a class apart. In many pictures he used clear blues and reds with strokes of black edges, thus giving an effect of stained glass. His book illustrations were notable, e.g. *Danse Macabre*, *Les Fleurs du Mal*, and those for his own *Misère et Guerre*.

Roubaix. Town of France, in the dept. of Nord. It stands on the Canal de Roubaix, which connects it with the Schelde and the Deûle, 6 m. N.E. of Lille. An important industrial centre, Roubaix manufactures woollens, cotton, linen, shawls and velvets, and has iron and copper foundries and machine works. The 15th century church of S. Martin was rebuilt in 1849. Other public buildings are the national school of industrial arts and a modern town hall. The town dates its prosperity from 1469, when the duke of Burgundy granted a charter to its manufacturers to weave cloth. During 1914-18 it was occupied by the Germans. Overrun again by the Germans in May, 1940, it remained in their hands until liberated, Sept., 1944, in the British 2nd army's rapid advance on Brussels. Pop. 100,978.

Roubiliac or **ROUBILLAC**, **LOUIS FRANÇOIS** (1695-1762). French sculptor, a native of Lyons. He studied under Balthazar and settled in England at some date between 1730 and 1738. His first important work was a statue of Handel for Vauxhall. The Nightingale monument in Westminster Abbey, the Shakespeare, now in the British Museum, and the Newton at Trinity College, Cambridge, are conspicuous works of his. He died in London, Jan. 11, 1762. A Life, by K. Esdaile, appeared in 1929.

Rouble. Russian unit of currency, the international value of which has been nominal since the Revolution of 1917. It is divided into 100 kopecks.

Roucher, JEAN ANTOINE (1745-94). French poet. He was born at Montpellier, Feb. 22, 1745. A descriptive poem,



Jean A. Roucher, French poet

Les Mois, 1779, gained him considerable reputation in an age when the artificial poetry of nature was in fashion. A moderate republican, Roucher denounced the Jacobins, and was guillotined along with his friend André Chénier (*q.v.*), July 25, 1794. *Pron.* Rooshay.

Rouelle, GUILLAUME FRANÇOIS (1703-70). French chemist. Born near Caen, he was living in Paris in 1742, when he was appointed chemical demonstrator at the Jardin du Roi, among his pupils being Lavoisier (*q.v.*). He is best known as the first to define salts, and for his investigations into ancient Egyptian methods of embalming. He died Aug. 30, 1770.

Rouen. City and port of France, capital of the dept. of Seine-Inférieure. It lies on the Seine, 87 m. by rly. N.W. of Paris, 54 m. by rly. and 80 m. by river E. of Havre. The main part of the town is on the right bank of the river, which is lined with extensive quays. The chief industry of Rouen is the spinning, preparation, and dyeing of cotton, but there are many industries connected with the port. At the suburb of Sotteville are railway workshops.

It is one of the greatest ports of France, the total tonnage entered and cleared annually being



Louis Roubiliac, French sculptor
After A. Carnantiers

nearly 3,000,000. Many improvements of its shipping facilities were made during the First Great War, when Rouen was the chief British base in France.

Modern alterations have driven broad, handsome streets through parts of the old town, but Rouen remains a picturesque and interesting city. The large Gothic cathedral, which was partly gutted in the Second Great War, dated from the 13th century. The façade dated from the 16th century. Of its two unfinished towers, which are of unequal height, the finer is the Tour de Beurre, 252 ft. in height. It was built with the money paid for indulgences to eat butter during Lent, and so received its name. The venerable Tour S. Romain is 245 ft. high, and dates almost entirely from the 12th century. Of the two side portals that in the north possessed some elaborate sculpture representing the Resurrection and the Last Judgement.

The interior was in Early Pointed style, and there were beautiful rose windows, partly of 13th century glass, in the nave and transepts. The choir had double aisles, and the transepts were divided by columns and arches into middle and side aisles. There were 13th and 14th century monuments in one of the chapels, while another contained the tomb of the first duke of Normandy. Of the fine monuments in the Lady Chapel the most imposing was that of Cardinal d'Amboise, the minister of Louis XII, and his nephew, also a cardinal, with groups of statuary. The heart of Richard Coeur de Lion was buried in the cathedral.

The Gothic church of S. Ouen, 14th cent., is architecturally more remarkable, though marred by the W. portal and towers built 1848-51. S. Maclou (1440-1521) has doors carved by Jean Goujon. Both these were seriously damaged in the Second Great War, as was the Musée des Beaux Arts, opened 1888; while the church of S. Vincent, famed for its glass, and the Palais de Justice (15th-16th cent.), once the seat of the parliament of Normandy, were both totally destroyed.

Rouen was the Roman Rotomagus. The bishopric dates from about 260. It became capital of Normandy, 912, and the Norman



Rouen arms

parlement or Échiquier was fixed here in 1302. Lost by John of England, 1204, it was held from 1419-49 by the English, who burnt Joan of Arc in the market place, 1431. Resisting the siege of Henry IV, 1591-92, it surrendered to him in 1596. It was entered by the Prussians in Dec., 1870.

Soon after the outbreak of the Second Great War base reinforcement depots for the B.E.F. were established at Rouen. On June 9, 1940, German troops entered the city, which was in German occupation until on Aug. 30, 1944, it

was liberated by the 1st Canadian army. It had been evacuated by the Germans, much of whose transport, waiting to cross the river in the rapid retreat from the W., had been severely bombed from the air and left derelict. The city was found to have suffered heavily from Allied air raids and German demolitions.

Among many famous Rouennais may be mentioned Corneille, Bojeldieu, Géricault, and Flaubert. Pop. 107,739. See Normandy.

Rouergue. Medieval county of France. Originally inhabited by

the Rutheni, it lay between Auvergne, Guienne, and Langue-doc, corresponding roughly to the present dept. of Aveyron. It was made a crown land by Henry IV in 1589. The capital was Rodez (*q.v.*).

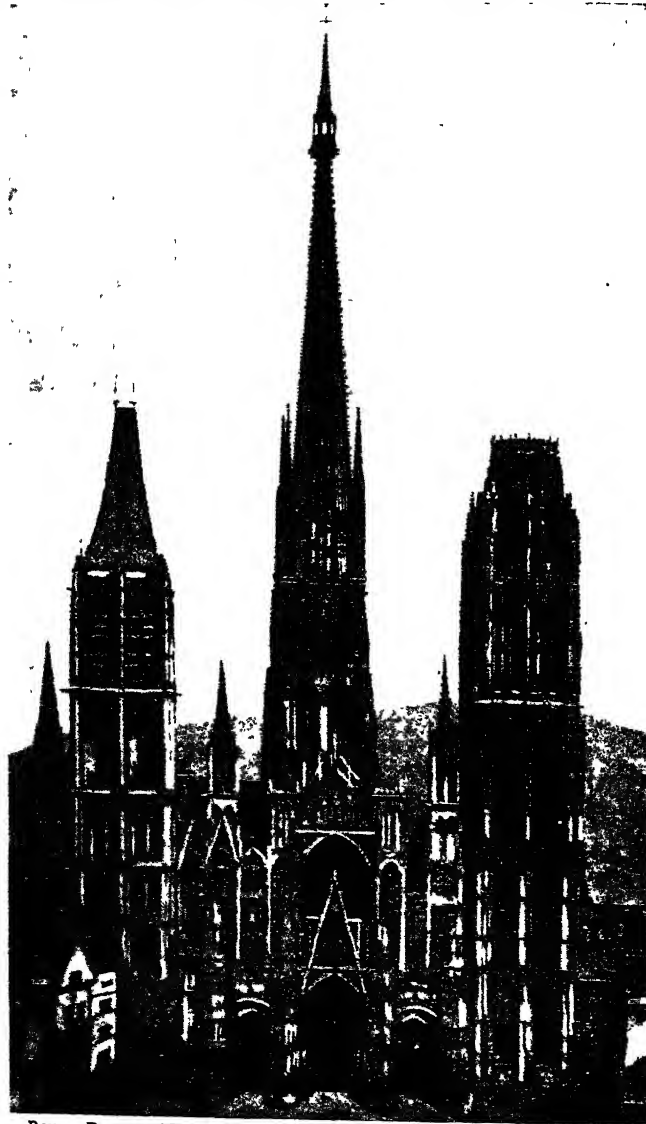
Rouge. Name given to a number of red colouring matters. The variety of rouge used for polishing glass and jewelry, on account of its freedom from grit, is the residue (iron oxide, Fe_2O_3) obtained in the manufacture of Nordhausen sulphuric acid from ferrous sulphate. It is also known as colcothar, and used as a pigment. The rouge employed in the toilet for the cheeks is usually a preparation of carmine, carthamin, or erythrosine.

Rouge et Noir (Fr., red and black). Gambling game with cards. It is played on an oblong table covered with green cloth, having at either end two large diamonds coloured red and black respectively, and a triangular space called inverse. In the centre are two divisions known as couleur.

Six packs are shuffled together, from which the dealer takes a convenient quantity in his hand each time a coup is dealt. Court cards count ten, and the ten down to ace bear their face value. The dealer first deals for noir until the pips on the cards faced in a line number 31 or not more than 40; and then does the same for rouge, the winning row being that containing pips totalling the nearest to 31. Should the pips number exactly the same (between 32 and 40) in both noir and rouge, the deal is void. In the event of both rows totalling exactly 31 each, half the stakes go to the bank, or the players have the option of leaving their entire stakes down for the next deal, the successful ones receiving their stakes back, but without any profit. In the case of the losers the bank takes all. This is called the *refait*.

Players who stake on couleur wager that the winning colour will be the same as the first card turned; those backing inverse, that it will be the opposite. Stakes placed on the red or black diamond denote the backing of that particular colour to win. The dealer holds the bank, and the other players are termed punters. The game is also known as *Trente et Quarante*.

Rouget de Lisle, CLAUDE JOSEPH (1760-1836). French soldier and poet. Born at Lons-le-Saunier, Jura, May 10, 1760, he owes his fame entirely to the song, *La Marseillaise*, which he wrote and com-



Rouen, France. West front of the Cathedral of Notre Dame, showing the ironwork spire; left, Tour S. Romain, and, right, the Tour de Beurre



Rouget de Lisle singing the Marseillaise. From the painting by Isidore Pils
Louvre, Paris

posed in 1792 while captain of engineers at Strasbourg. He had previously enjoyed some success as a singer and violinist. He was imprisoned under the Terror because, a son of royalist parents, he refused to take the oath to the Constitution which abolished the crown. Wounded at Quiberon, 1795, he left the army and lived in straitened circumstances until Louis Philippe granted him a small pension in 1830. He died June 26, 1836. See Marseillaise.

Roughrider. Originally one who rode or trained untamed horses, i.e. a horsebreaker. From that it came to be used for soldiers in the cavalry and artillery who did this kind of work, and who wore a spur on the sleeve as a badge. Still later, bodies of mounted men raised for service in time of war called themselves roughriders; among such were the City of London Yeomanry and the regiment raised by Theodore Roosevelt for service during the Spanish-American War.

Rougon-Macquart, LES. General title of a series of novels by Émile Zola. In them are followed the fortunes of various members of the inter-married Rougon and Macquart families. Twenty novels are comprised in this series: La Fortune des Rougon; Son Excellence Eugène Rougon; La Curée; L'Argent; Le Rêve; La Conquête de Plassans; Pot-Bouille; Au Bonheur des Dames; La Faute de L'Abbé Mouret; Une Page d'Amour; Le

Ventre de Paris; La Joie de Vivre; L'Assommoir; L'Oeuvre; La Bête Humaine; Germinal; Nana; La Terre; La Débâcle; and Le Docteur Pascal.

Rouher, EUGÈNE (1814-84). French statesman. Born at Riom, Nov. 30, 1814, he became a barrister and entered the constituent assembly for Puy-de-Dôme, 1848. Minister of justice, 1849-51, he tacitly supported the *coup d'état*, and in 1853 became minister of agriculture and public works. He negotiated the Cobden treaty, 1860, and, minister of state from 1863, was a leading champion of imperial policy, e.g. of the Mexican expedition and the suppression of press liberties. He resigned office, 1869, became president of the senate, and fled to England after the fall of the empire. Deputy for Corsica, 1872-75, he defended the Bonapartist cause. He died in Paris, Feb. 3, 1884.

Roulade (Fr. *rouler*, to roll). In music, a florid vocal passage, with many runs.

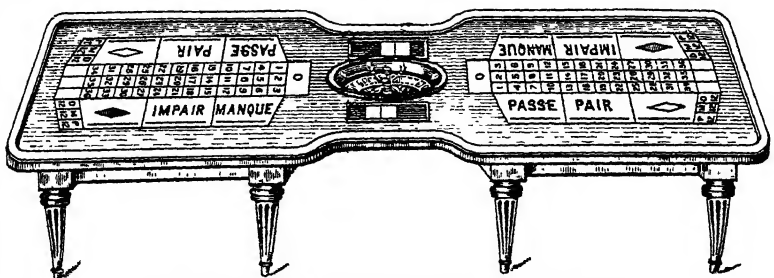
Roulers (Flemish, *Rouselaere*). Town of Belgium, in the prov. of W. Flanders. It lies on the small streams Vyverbeek and Mandel,

19 m. by rly. S.S.W. of Bruges, and is a junction for the Ypres, Menin, and Courtrai lines. An industrial town, it has few points of interest save the church of S. Michael, with a conspicuous Gothic tower. Linen is the chief manufacture, with industries in cotton, lace, chicory, tobacco, and pottery. Roulers was noted for its cloth as early as the 11th century and was at that time an important town. Its flourishing textile industries came to a standstill in the First Great War, but restarted soon after the armistice.

Near Roulers, on July 13, 1794, the Austrians under Clerfaut were defeated by the French under Pichegru and Macdonald. An important German centre during the First Great War, it was recaptured by French troops in Oct., 1918. Pop. 30,344. See Ypres, Battles of.

Roulette. Gambling game. The following is a description of roulette as played at Monte Carlo. The roulette wheel itself is sunk in the centre of an oblong table covered with green cloth. The base of the wheel is poised on ball-bearings, and by turning with the hand a small cross-bar rising from its axis, it can be made to revolve very rapidly.

The circular bed is divided into 37 compartments. Taking 0 (zero) as a starting point at the top of the circle, the numbers are arranged in this order, following round from right to left: 32, 15, 19, 4, 21, 2, 25, 17, 34, 6, 27, 13, 36, 11, 30, 8, 23, 10, 5, 24, 16, 33, 1, 20, 14, 31, 9, 22, 18, 29, 7, 28, 12, 35, 3, 26; zero being situated between 26 and 32. Zero is coloured green; the other compartments are black and red alternately; 32 being red, 15 black, and so on. A white ivory ball is thrown into the moving machine, the ball being spun in an opposite direction to that in which the wheel is rotating, in order to avoid all chance of cheating by sleight of hand on the part of the operator; the compartment in which the ball



Roulette table, showing arrangement of numbers in the lay-out

finally rests indicating the winning number.

At each end of the table is a lay-out marked off into various divisions. In the centre are arranged, in twelve rows of three, squares containing the figures from 1 to 36, and a square at the top for zero. On each side are spaces representing *Passe*, *Manque*, *Pair*, *Impair*, *Black*, and *Red*; and at the bottom are spaces marked *P 12*, *M 12*, and *D 12*. On this lay-out all stakes are placed, and indicate by their positions the nature of the various chances, which, with the odds paid, are as follows. *En plein*. Any one single number; odds 35 to 1. *À Cheval*. Two numbers; odds 17 to 1. *Transversale*. Three numbers in a horizontal position; odds 11 to 1. *Un Carré*. Four numbers; odds 8 to 1. *Transversale Six*. Six numbers (two sets of numbers in a horizontal position); odds 5 to 1. *Bas*. The twelve numbers contained in one of the three vertical columns; odds 2 to 1. *Bas à cheval*. Embracing the numbers in two of the three columns; odds 1 to 2. *Premier, Milieu, Dernier*. Stakes placed on the spaces marked *P 12*, *M 12*, and *D 12*; these embrace the numbers from 1 to 12, 13 to 24, and 25 to 36. Odds 2 to 1; if two of these are backed the odds paid equal 1 to 2. In the foregoing combinations of numbers or chances, they must be such as can be plainly indicated by the position of the stake upon the lay-out. The even chances are: *Rouge*. That the number will be red. *Noir*. That it will be black. *Impair*. That it will be odd. *Pair*. That it will be even. *Manque*. That the number will be from 1 to 18. *Passe*. That it will be from 19 to 36.

Zero is the equivalent of the *refait* at *trente-et-quarante*. The stake is imprisoned until the next coup is decided. If the latter is won the stake is released. Another feature operating against the player, and a great safeguard to the bank, is the maximum set by the administration to each variety of bet. A player may thus go on doubling his stake on a series of losing coups and eventually be compelled to return to a flat stake before backing a winning colour or number; in which event he would not succeed in recovering his previous losses. See *Complete Hoyle*, R. F. Foster, 1897; *Roulette: a Treatise on the Game*, by H., 1904.

Roumanille, JOSEPH (1818-91). Provençal author. Born at



Joseph Roumanille,
Provençal author

St. Rémy, Bouches-du-Rhône, he was for some time a teacher in a school at Avignon, where he set up as a publisher. In 1817 he published the first volume of his poems, *Li Marbarideto* (The Easter Daisies), and in 1854, with F. Mistral and other friends, established the *Félibrige* which was to restore the Provençal as a literary language. In the same year he collected his poems as *Lis Oubreto*. He started the Provençal journal, *L'Armana Prouvencau*, in 1855, and continued during many years to write stories and poems in the language he had done so much to re-establish. He collected his prose writings in 1889. A new edition of his *Oubreto en Vers* was issued in 1903, accompanied by a French translation and a biographical sketch.

Round. Literally, something circular or globular. In boxing the word is used for the periods or bouts during which no respite is allowed; each round is followed by a pause, and a contest is usually limited to 20 or some smaller number of rounds. (See *Boxing*.) A round is one stage in a sporting event, consisting of all the contests held simultaneously, whether the losers are eliminated or each contestant is to meet all the others. The word is also used for a discharge of firearms, a burst of applause, and the beat of a policeman or watchman. Postmen, milkmen and other vendors are also said to have rounds. Other uses are for a game of golf, the rung of a ladder, and a slice of bread or toast. In brewing, a round is a vessel for holding beer while undergoing fermentation. In the U.S.A. a round trip or round ticket is a return journey or ticket. Roundabouts is the name given to a number of mechanical horses or other devices, linked together, on which persons are carried round and round for amusement; and, by analogy, to a road-junction where the traffic moves circularly.

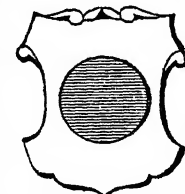
Round. In music, species of canon (*q.v.*) for equal voices, in which the performers all sing the same melody, but make their respective entries in succession. The earliest piece of concerted vocal music extant, *Sumer is icumen in*, is a round. (See *Catch*.)

Round is also the name given to a dance in which the performers stand in a circle.

Round, DOROTHY EDITH (b. 1909). English lawn tennis player, born July 13, 1909, at Dudley. She played in Wightman Cup matches against the U.S.A., 1931-36, and won the British hard court championship in 1933 and 1934. In the first of those years she lost the Wimbledon final to Helen Wills, but next year she won it against Helen Jacobs, and repeated the success in 1937 against J. Jedrzejowska.

Roundel or **ROUNDELAY** (Fr. *rond*, round). In music, the tune to which a poem of the same name was sung, and in which the first strain was repeated at intervals, thus giving the impression of a circle or round. In instrumental form this has developed into the *Rondo* (*q.v.*). Roundel was also the name of a dance in which the performers stood in a circle and joined hands.

Roundel. In heraldry, circular or rounded charges, having different names according to their tinctures, as follows: Gold or yellow, a bezant; silver or white, a plate; red, a torteau; blue, a hurt; green, a pomme or po-meis; black,



Roundel in heraldry

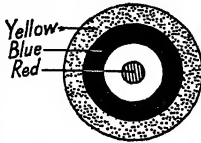
an ogress, a pellet, or a gunstone; purple, a golpe or wound; sanguine, a guze; tenné, an orange. In old heraldry these were all described as roundels, except bezants and plates, the tinctures being specified. A plate crossed by three horizontal blue bands is called a fountain. Shot, when so described, should be drawn as rounded balls, not flat; but the bezant and plate should always be mere disks. A shield strewn with gold roundels is said to be "bezanty," but if with other roundels, it should be described as "semée de plates," "semée de torteaux," and so on. See *Heraldry*.

Roundel. In aeronautics, identification mark on aircraft. Roundels are usually circular and made up of concentric rings in the national colours of the aircraft's country. Certain nation-



Dorothy Round,
English lawn
tennis player

alities have a device inside the roundel, such as the star in the American roundel and the crescent in the Turkish. The R.A.F. uses three roundels: one on the fuselage with four concentric rings of yellow, blue, and red; one on the upper surface of the wing, blue with a red centre; and one on the lower surface with concentric rings of blue, white, and red.



Roundel. As used by the R.A.F. on the fuselage of an aeroplane

Rounders. Ball-game which became popular in Great Britain early in the 18th century. Originally rounders was played in a somewhat free-and-easy fashion, there being no restriction as to the number of players on the "in" or the "out" side. The field was marked out in a regular pentagon with five bases 15-20 yards apart.

The feeder or bowler, standing near the centre of play, tossed the ball to the striker, who with a round stick endeavoured to hit the ball as far as possible, so as to complete the round of the bases before the ball was thrown up, thereby scoring a rounder. The striker was out if hit by the ball thrown at him whilst between any of the bases; if the ball were caught from a hit before touching the ground or on the first bounce; or if he missed striking the ball in three consecutive tosses.

In 1889 the Rounders Association of Liverpool and Vicinity and the Scottish Rounders Association were formed, and rules drawn up. The area of play was changed to the form of an elongated diamond; the number of players restricted to ten on each side; and the dimensions of the "bat" fixed at 35 ins. in length by 3½ ins. in diameter. The ball was made harder in substance, and thereafter, to put the striker out when running between bases, a fielder had to touch him with it instead of throwing it at him. The last man in might call for "three fair hits for the rounder," and if successful in hitting the ball to a sufficient distance for him to negotiate safely the whole round of the bases, he obtained another innings for his side. See Baseball.

Roundhay. Residential district of the N.E. of Leeds, England, served by tramway from the centre of the city. It is notable for Roundhay Park (372 acres, including a lake, 33 acres).

Purchased by the Leeds corporation in 1872, this is one of the largest and most beautiful public parks in the country. The first overhead trolley tramway service in the U.K. ran to the park in 1891.

Round-headed Rampion (*Phyteuma orbiculare*). Perennial herb of the family Campanulaceae. A native of Europe, it has a tuberous rootstock from which several stems arise. The leaves are ovalance-shaped, and the slender deep-blue flowers are gathered into a globose head, which gives them a superficial resemblance to the plant known as a scabious.

Roundheads. Name applied to the supporters of the parliamentary cause in the English Civil War in derisive reference to the close-cropped hair of the Puritans. Like the corresponding word cavalier (*q.v.*), it was first used in the rioting which took place outside the houses of parliament towards the end of 1641, and again, like the other, though first a word of reproach, was ultimately adopted as a title of honour. See Army, British; Cromwell.

Round Robin. Term applied to a petition or complaint signed by several persons. Strictly it is one in which the names are arranged in a circle to conceal the order in which they were written. The use of this circular arrangement dates from remote times, and is due to such motives as fear, respect, or delicacy; it was popular with

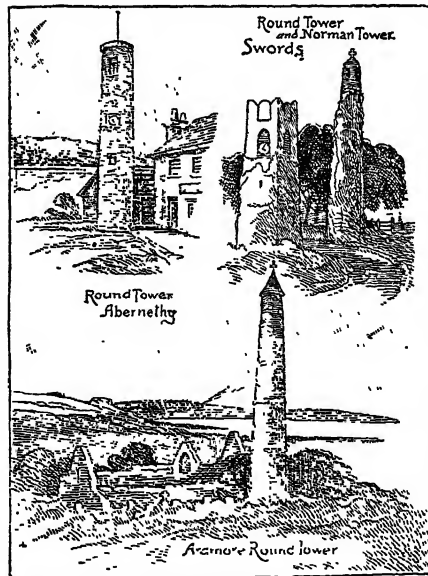
mutinous seamen. A well-known instance of a round robin is that signed in 1776 by Reynolds, Burke, Gibbon, and others praying Dr. Johnson to amend his epitaph for Goldsmith, and requesting him to write it in English instead of Latin. The name round robin is used for the angler (*Lophius piscatorius*) and other fishes, and in Devon for a small pancake.

Round Table OR **TABLE ROUND.** In medieval legend, the table at which King Arthur and his knights dined, also an order of knighthood maintained by Arthur. The table is first mentioned by Wace, and described at length by Layamon. It was made round so as to avoid rivalry for precedence. In the *Morte D'Arthur* it is said that the order was instituted by Arthur's father Uther Pendragon. When Arthur married Guinevere her father sent with her the Round Table and 100 knights. The full number of knights of the table was 150. At the table, according to some romances, was one seat known as the Siege Perilous, which was left vacant and reserved for the knight who was to achieve the quest of the Holy Grail; for any other it would prove fatal. King Arthur's round table preserved at Winchester is believed to be no older than the time of Stephen. See Arthur.

Round Table. British quarterly periodical. This non-party review of world politics, founded 1910, is pub. by an editorial committee, meeting at Rhodes House, Oxford. It specialises in Brit. Commonwealth affairs.

Round Table Conference. Term for any group of persons representing various interests which meets at a round table for discussion. It was used in particular of the three conferences held in London 1930-31 between British and Indian representatives which led to the drafting and passing of the Government of India Act, 1935.

Round Tower. Tall slender stone structure, of which there are notable examples in Ireland. Apparently erected in the 9th to 13th centuries, these towers served as detached belfries, watch-towers, and strongholds for ecclesiastics



Round Tower. Examples of the stone towers built by the ancient Celtic inhabitants of the British Isles
From drawings by C. G. Harper

and their valuables. Of 120 recorded, 10 still retain their conical caps, including Ardmore, co. Waterford, 95 ft.; Clondalkin, co. Dublin, 90 ft.; Devenish, co. Fermanagh, 85 ft.

Towers are also found at Peel, I.O.M.; Abernethy, Perthshire; Brechin, Angus, 85 ft.; Egilshay, Orkney. They had an ultimate Byzantine derivation, through the campaniles of early Ravenna, whence the Muslim minaret may also have sprung. Of greater antiquity are the shorter and wider megalithic round strongholds, as in Rabbath Ammon, Syria; the Balearic Islands; Scotland; and Sardinia. The Round Tower, Windsor Castle, was built by Edward III. See Antrim; Brechin; Broch; Glendalough; Ireland; Nuraghe; Talayot; Windsor. *Consult* The Round Towers of Ireland, H. O'Brien, 1834.

Roundway Down. Hill just N. of Devizes, Wilts, known for the battle fought here during the Civil War, July 13, 1643. After their losses at Lansdown Hill, the royalist force under Sir Ralph Hopton retired towards Oxford. The parliamentary force under Sir William Waller followed them and took up a position on Roundway Down which commanded the road from Devizes (where the royalist foot soldiers were) to Oxford. Under Prince Maurice a body of royalists, however, arrived to aid their comrades, and occupied the hill after Waller had led down his men to besiege Devizes. Thereupon Waller turned to attack the Down, but his horsemen were quickly repulsed, and in a few moments were in flight, while his infantry found themselves taken in the rear and, 1,800 in number, were all either killed or made prisoners. Waller himself escaped with his cavalry from the field. See Civil War.

Roundworm. Popular name for *Ascaris lumbricoides*, a parasitic worm belonging to the nematoda. See Ascaris.

Roukol. Typical low density explosive on the permitted list. The roukols contain 10-15 p.c. nitroglycerine; 43-57 p.c. ammonium nitrate; 10-13 p.c. sodium chloride; with stabilisers. The advantage of this type of explosive is that it acts over a great length of material and has a small shattering effect on coal when used in mines.

Roup. Common and serious disease attacking fowls which are too closely confined. In the catarrhal form the fowl shows symptoms

of a severe cold, with discharge from the nostrils and the mouth, which later dry up, producing what is known as dry roup. The disease is highly contagious, so infected poultry should be isolated. See Fowl; Poultry. *Pron.* Roop.

Roup. In Scotland, a sale by auction. The conditions of sale are called articles of roup and the seller is the exposer. See Auctioneering.

Rouse Case, THE. British cause célèbre. In the early morning of Nov. 6, 1930, a burning Morris Minor car was found near Hardingsstone, Northants. Inside it was a charred human body. Two passers-by saw a man walking away from the car, which was later identified as the property of Alfred Arthur Rouse, a commercial traveller from Finchley. Although the body was first thought to be his, it was soon found that he had been at home some hours after the fire, and he was arrested at Hammersmith on the evening of Nov. 7. At his trial the prosecution showed that he was in considerable financial and other difficulties and alleged that he had planned to disappear, or, in collusion, to draw £1,000 insurance money. Rouse claimed that the fire was accidental. He was sentenced to death at Northampton, Jan. 31, 1931, and hanged at Bedford, March 10. The victim, whom Rouse claimed to have picked up casually on the road and who was presumed to be a tramp, was never identified.

Rousseau, HENRI JULIEN OR DOUANIER ROUSSEAU (1844-1910). French painter. Born at Laval, May 21, 1844, he received no art training. During the Mexican War, 1861-67, he was an army musician, also serving in the Franco-Prussian War, 1870-71. Later he settled in Paris as a customs official; hence his pseudonym Le Douanier. He opened a stationer's shop where his pictures attracted the attention of well-known artists; also a school where he taught painting, music, and dramatics, exhibiting at the Salon des Indépendants during 1886-1910. He died Sept. 9, 1910. A simple bourgeois, Rousseau went back to nature without the critical restraint of the Impressionists or Cubists, restoring to the tactile elements all their former prestige. He painted landscapes, jungle scenes, and portraits in a naïve, genial manner. He is represented at the Louvre, Luxembourg, and other European galleries.

Rousseau, JEAN BAPTISTE (1670-1741). French poet. Born in Paris, April 6, 1670, the son of a

shoemaker, he produced several works for the stage without much success, but achieved considerable reputation by his lyrical poems. In 1712 he was banished from France on a charge of writing defamatory libels, and spent the rest of his life in exile, dying in Brussels, March 17, 1741. His odes and cantates, warmly admired by contemporary critics, are correct in form but lack fire and spontaneity.



Jean Baptiste Rousseau, French poet

Rousseau, JEAN-JACQUES (1712-78). French philosopher. The son of a watchmaker, who was also a dancing-master, he was born at Geneva. His mother died a fortnight after his birth, and his father, while he was still a child, quitted the town, leaving him in the charge of relatives. Apprenticed to an engraver, he ran away at 16 from Geneva to Savoy. A Mme. de Warens harboured him, and made arrangements for his reception into the R.C. Church. For many years he lived in her house, though he was often absent for considerable periods, first at Annecy and afterwards at Chambéry, performing the duties of an upper servant and enjoying the privileges of an adopted son. He states in his Confessions that he became her lover, but doubt has been thrown on this.

In 1741 Rousseau settled in Paris. He formed a connexion with Thérèse le Vasseur, a seamstress employed in the hotel in which he boarded, who remained his companion until his death. The statement in the Confessions that he eventually married her is untrue, the alleged marriage being an illegal ceremony. The five children whom she bore him were sent to a foundling hospital, where all trace of them was lost.

In Paris, Rousseau lived by literary and secretarial work. For some months he was in Venice as secretary to the French ambassador. He contributed, mainly on musical subjects, to the Encyclopédie edited by Diderot and d'Alembert; and in 1750 he woke up and found himself famous as the author of a prize essay on a theme propounded by the Academy of Dijon, "Has the Progress of the Arts and Sciences helped to Corrupt or to Purify Morals?" He answered the question para-

doxically in a sense hostile to art and science; and in 1753 followed up the same train of thought in an *Essay on Inequality*. Resolved thereafter to be "the man of his book," he cut himself adrift from the aristocratic society which sought to pet and pamper him, and lived a simple life, mainly in country places near Paris, supporting himself by copying music, while writing books which were to give him a permanent place in the history of French literature and philosophic thought.

The first of these was a novel, *La Nouvelle Héloïse*. Composed under the influence of Samuel Richardson, whose romances then had a great vogue in Paris, it marks



Jean-Jacques Rousseau,
French philosopher

a distinct stage in the development of French fiction, and may be said to have launched the romantic movement in French literature. Mme. de Staël's novels, and the early novels of George Sand, are largely modelled on it. *Le Contrat Social*, which came next, might be described as an impassioned version of Locke's *Treatise on Government*. It became, if not the bible of the Revolution, at least the bible of the Robespierre party among the revolutionists, since it justified not only the overthrow of the existing despotism, but also the creation of a new despotism, on a basis alleged to be rational. *Émile* is a treatise on education, a plea in the matter for home training.

In *Émile*, Rousseau advocated natural religion as a substitute for the doctrinal teaching of the Church, and consequently he was warned that if he did not leave the country he would be arrested. He fled to Switzerland, and, after

some wanderings, found refuge in what is now the canton of Neuchâtel, but was then a dependency of the king of Prussia. There, in the Jura, he lived from 1762 till 1764, when a local demonstration again drove him to flight. For a season he sojourned in the island of Saint-Pierre, on Lake Bièvre; but the Bernese authorities turned him out, and he decided to go to England, where Hume promised to find a quiet retreat for him.

His proceedings in England were odd, and can be explained only on the assumption that he was insane. He quarrelled with Hume, and with all his friends and benefactors, and returned to France in 1767. For about a year he lived in the prince de Conti's country house at Trye, near Gisors, under the assumed name of Renou, and, after other wanderings, settled in Paris in 1770. His life there was, at last, tolerably peaceful; his time largely occupied in composing and reading to his friends the *Confessions* which were published after his death. At the same time, his conduct gave accumulating indications of insanity; he had the fixed idea that he was the persecuted victim of a mysterious conspiracy. In 1778 he accepted an invitation to take up his residence in a house belonging to the marquis de Girardin at Ermenonville, near Paris, and there he died on July 2 of the same year. The suggestion that he committed suicide is not supported by conclusive evidence. Thérèse, who survived him, married a groom. See *Education*; *Social Contract*; *State*.

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Rousseau, PIERRE ÉTIENNE THÉODORE (1812-67). French painter. Born in Paris, April 15, 1812, he studied under Rémond and Guillon-Lethière. Influenced at first by the Dutch landscapists, he soon went straight to nature for his subjects; travelled in Auvergne and Normandy; and in 1848 settled at Barbizon on the borders of the forest of Fontainebleau. For thirteen years from 1835 his pictures were regularly

rejected by the Salon jury on account of their departure from established conventions; in 1849, however, a new jury admitted



Théodore Rousseau,
French painter

his work and awarded him a first-class medal, and henceforward his progress was unimpeded. At Barbizon he lived an almost monastic life, caring only for his beloved forest and his art, and there he died, Dec. 22, 1867. Théophile Gautier called him the Delacroix of landscape. His colour, broadly handled, was always fresh and vigorous; his drawing admirable; and his example, not only as regards the Barbizon group, but all modern landscape, of lasting effect. See Barbizon; consult also *Souvenirs sur Rousseau*, A. Sensier, 1872; *The Painters of Barbizon*, J. W. Mollet, 1890.

Roussel, ALBERT (1869-1937). French composer. Born at Tourcoing, April 5, 1869, he studied music in Paris and eventually made his name with a ballet, *Le Festin de l'Araignée*, 1913. An opera-ballet, *Padmavati*, followed in 1923. He also wrote symphonies; three symphonic poems, *Évocations* (1910-11); an opera, *La Naissance de la Lyre*, 1921-23; and many songs. His music is colourful and shows the influence of Stravinsky. Roussel died in 1937, and an appreciation of the man and his work, by N. Demuth, appeared in 1948.

Roussillon. One of the provinces into which, before the Revolution, France was divided. It is now covered mainly by the dept. of Pyrénées-Orientales. Roussillon originated in a county surrounding the little town of that name, but Perpignan became its capital. The first count made his appearance about 900, and his successors added to its area, Cerdagne and Bésalu being joined to it and after a while sharing the common name. It gave its name to a wine.

Roussillon was subject to the crown of France, as it had been since the end of the Carolingian Empire, but in the 12th century the king of Aragon became, by inheritance, its actual ruler. This led to difficulties, and in 1258 Louis IX formally surrendered the county to Aragon. Later it became a little kingdom for a Spanish prince, but in 1344 was again united with Aragon. In 1462 it was

seized by Louis XI of France, and in 1493 was restored to Ferdinand and Isabella of Spain. Again in the 17th century it was in dispute between France and Spain, but in 1659, by the peace of the Pyrenees, finally became French. See Perpignan.

Routledge, GEORGE (1812-88). British publisher. Born at Brampton, Cumberland, Sept. 23, 1812, he



George Routledge,
British publisher

settled in London, 1833, after serving an apprenticeship to a bookseller in Carlisle. He started a business as retail bookseller with W. H. Warne, 1836, began publishing in 1843, and, joined by Frederick Warne, founded the firm of Routledge and Co. in 1852, a style altered to that of George Routledge and Sons in 1865, when his sons, Robert and Edmund, had been taken into partnership. He established a New York branch in 1854, retired in 1887, and died Dec. 13, 1888. He made a great success of a railway library which extended to well over 1,000 volumes, and in addition to publishing a series of British poets, and works by Lytton, Disraeli, Ainsworth, Mayne Reid, Longfellow, etc., issued Routledge's Universal Library, edited by Henry Morley. Later Herbert Read (q.v.) became a director.

Roux, PIERRE PAUL ÉMILE (1853-1933). French bacteriologist. Born at Confolens, Charente, Dec. 17, 1853, he studied medicine at Clermont-Ferrand, and worked under Duclaux. He entered Pasteur's laboratory in 1878, and became its director in 1904. In association with Pasteur, he experimented in many directions, inquiring especially into the nature and prevention of anthrax, hydrophobia, and diphtheria. Roux published his studies on diphtheria in 1889, and became known through his discovery of the antidiaphtheric toxin. He died in Paris Nov. 3, 1933.

Rouyn. A town of Quebec, Canada. It is near Lake Noranda, 425 m. N.W. of Montreal and 500 m. N. of Toronto, and owes its

existence to the discovery of rich deposits of copper and gold in the district in 1925.

It is served by the Nipissing Central rly. and by a branch of the C.N.R. Pop. 8,808.

Rovato. Town of Italy, in Brescia prov., Lombardy. It is a rly. junction 11 m. W.N.W. of Brescia, on the line from Milan to Verona. On the W. is the convent of San Michele, situated on the long ridge of Mont' Orfano, the southernmost section of the morainic deposits of the Franciacorta. Pop. est. 5,000.

Rovereto or **ROVEREDO.** Town of Italy, in the Trentino. On the Leno, and in the valley of the Adige, it is 15 m. S.S.W. of Trent by the Brenner rly. It is commanded by a castle, later used as a barracks, which, burnt down in 1487, was rebuilt by the Venetians in 1492. The buildings include the 15th century church of San Marco, that of Santa Maria del Carmine, built in the 14th century and now used as a sacristy to a later one, and the old palace of the counts of Arco, restored in 1906, and now a bank. Antonio Rosmini-Serbati was a native. The chief industrial

town of Tirol, this is a centre of the Tirolese silk trade. Leather and paper goods are manufactured; cereals, wines, and fruit are articles of trade. The town was heavily damaged in the First Great War. Pop. est. 14,000.

Rover Scout. Grade in the Boy Scout movement.

All scouts over 18 years of age may become Rover scouts on passing tests. Rovers are formed into crews, a rover crew forming part of every complete scout group. See Boy Scout.

Rove Tunnel. Tunnel on the Marseilles-Rhône Canal, France. It was begun in 1911, pierced in 1921, and completed in 1925. It lies under the hills N.W. of Marseilles in the peninsula between the Étang de Berre and the Gulf of the Lion. It is 4½ m. long, 72 ft. wide, 45 ft. high, and 13 ft. deep, and permits the passage in each direction of sea-going 1,200-ton barges. The tunnel makes the Étang de Berre (q.v.) an appendage to the important harbour of Marseilles. See Rhône map.

Rovigno. Adriatic seaport. It lies 40 m. S. of Trieste. The cathe-

dral of S. Euphemia is modelled on that of S. Mark at Venice, and has a campanile with a statue of the saint. Vines and olives are cultivated and there are manufactures of oil, tobacco, and cement, and tunny and sardine fisheries. Marble is quarried in the neighbourhood. Between the town and the rly. station is a zoological museum with special exhibits of Adriatic fauna. Off the coast are the Brionian islands, a favourite sea-bathing resort. Formerly in Austria-Hungary, Rovigno became Italian after the First Great War. Italy ceded it to Yugoslavia under the peace treaty of 1947.

Rovigo. Maritime province of N.E. Italy, in S. Venetia. It is traversed by the Adige, and the Po flows along the S. boundary. The surface is level, marshy by the sea, and much canalised. The chief products include rice, hemp, grain, silk, wine, and cattle. Its area is 684 sq. m. Pop. est. 250,000.

Rovigo. City of Italy, capital of the prov. of Rovigo. It stands on the Adigetto, and is a junction, 28 m. by rly. S. of Padua. It contains several old churches and palaces,



Rovigno, Yugoslavia. Quays in the fishing harbour

and portions of its ruined 10th century walls, and a medieval castle, also in ruins. Among other notable buildings are the town hall, picture gallery, and library. Manufactures include leather, silk, woollens, linen, and candles, and brewing and dyeing are carried on. First mentioned in 838, it belonged successively to the Este family, Venice, and Austria. The Duomo sustained damage to roof and windows in the Second Great War. Other damage was slight. Pop. 39,954.

Rovno (Pol. *Rowne*). Town of Ukraine S.S.R. It is 110 m. W.N.W. of Zhitomir, on the Usty, and is an important rly. junction. Its prosperity was built up largely by Jews, who carried on an extensive trade in grain timber, and cattle. It was promi-



Pierre Paul Roux,
French bacteriologist

nent in the First Great War, the Rovno-Vilna line being an objective of the Germans in their advance against the Russians in 1915. It was held by the latter, despite determined efforts to outflank it, until 1918. It went to Poland under the treaty of Riga, 1920, and came into Russian occupation at the partition of Poland in 1939. Taken by the Germans soon after they attacked the Russians in 1941, Rovno was for long the centre of administration of the German-occupied "eastern territories." It was recaptured Feb. 5, 1944, in a spectacular advance by armour and infantry of the 1st Ukrainian army. It was in the territory which reverted to Russia by the Russo-Polish treaty of 1945.

Rovuma. River on the boundary between Mozambique and Tanganyika Territory. It rises E. of Lake Nyasa, and flows 450 m. to the Indian Ocean, which it enters N. of Cape Delgado. It was explored by Livingstone and Kirk in 1862.

Rowallan, THOMAS GODFREY POLSON CORBETT, 2ND BARON (b. 1895). Chief Scout of the

British Commonwealth. Born at Gourrock, Dec. 19, 1895, he was educated at Eton and Sandhurst and commissioned in the Royal Scots Fusiliers, of which he commanded a



Lord Rowallan, Chief Scout of the British Commonwealth

battalion in France in 1940. He retired from the army in 1944, and in 1945 was appointed chief scout. He succeeded to his father's peerage in 1933.

Rowan. Variant name for the Mountain Ash (*q.v.*).

Rowe, FREDERICK MAURICE (1891-1946). A British chemist. Born at Stroud, Feb. 11, 1891, he was educated there, at Leeds university, and Brunswick technical school. Lecturer and head of the dyestuffs research laboratory at the college of technology, Manchester, 1916-25, he held the chair of colour chemistry at Leeds from 1926 until he died, Dec. 8, 1946. Rowe edited the journal of the Society of Dyers from 1932.

Rowe, NICHOLAS (1674-1718). English dramatist. Born in Bedfordshire, and educated at Westminster, he wrote eight plays, of which the best are *The Fair Penitent*, 1703, and *Jane Shore*, 1714.

The former contains the character of Lothario, who has passed into the currency of the language as the typical deceiver of women. Rowe was a master of pathos. He was a great student of Shakespeare, and published an edition of his works. In 1715 he received the poet laureateship, and he died Dec. 6, 1718.

Rowena. Character in Scott's novel *Ivanhoe*. Ward of Cedric the Saxon, she is in love with Cedric's son, *Ivanhoe*, who is banished because Cedric desires the beautiful heiress to marry his kinsman Athelstane. Chosen queen of the tournament at Ashby, she crowns the victor, *Ivanhoe*, and is captured by De Bracy, who threatens to kill both Cedric and *Ivanhoe* if she



Nicholas Rowe, English dramatist
After Kneller

refuses her hand to him. She is rescued, and finally married to *Ivanhoe*.

Rowett Research Institute. British field laboratory engaged in research on the nutrition of farm animals. It is a bureau of the executive council of the Imperial Agricultural Bureaux (*q.v.*), and its laboratory is at Bucksburn, near Dundee.

Rowfant. Locality in Sussex, England, 4½ m. W. of East Grinstead. In the old Tudor house here Frederick Looker-Lampson (*q.v.*) lived for the last 20 years of his life and stored his valuable library. Among the books in this famous collection may be noted a fine copy of the Shakespeare first folio, 1623; many early editions of Shakespeare's plays, Pope's copy of Chapman's translation of Homer, 1611, rare editions of the Elizabethan dramatists, and of the works of Bunyan, Defoe, Swift, Goldsmith, Fielding, Wordsworth, Thackeray, and Dickens.

ROWING: THE ART OF OARSMANSHIP

* Kenneth Payne. Rowing Correspondent, Daily Telegraph

The following is one of a group of articles, e.g. Boxing; Cricket; Football; Swimming; Sculling, dealing with sports. See also Boat

The history of the oar goes back fifty centuries, and the problems attending its use were worked out scientifically and practically by the builders of the ancient triremes and other war galleys. These have been fully discussed by Lord Desborough and by Dr. Warre. Now, however, except for its use by certain classes of fishermen and shore boatmen, rowing is almost solely a sport, and its history belongs to the last hundred years, centring as it does in the race rowed annually, since 1829, between crews representing the universities of Oxford and Cambridge, and the annual regatta which takes place at Henley. (See *Henley Regatta*.)

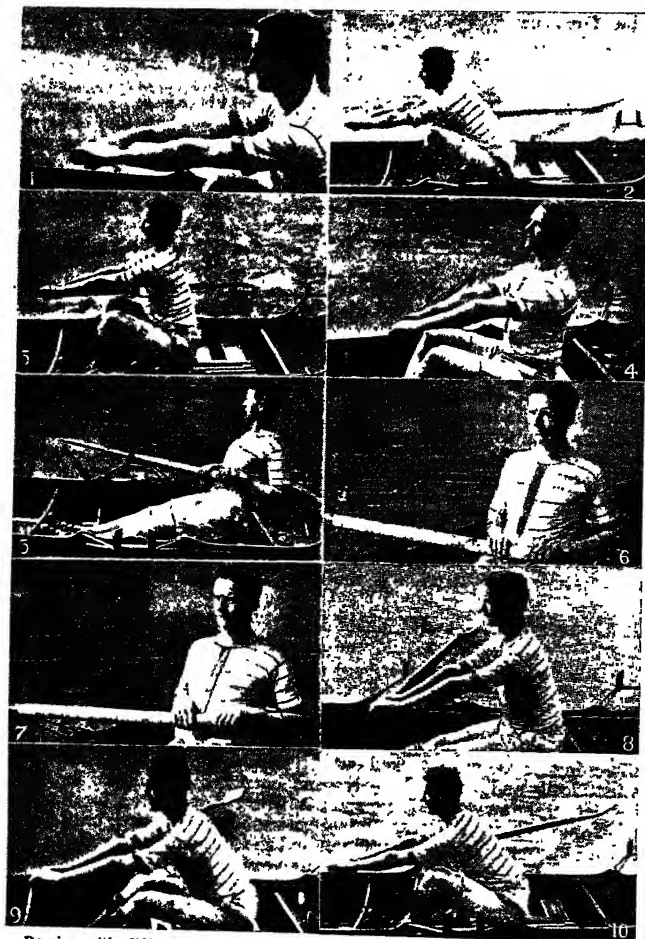
The first university boat race was held at Henley, and the Oxford boat is still preserved. She was 45 ft. 4 ins. long, with a beam of 4 ft. 4 ins., and a depth (forward) of 2 ft. 5½ ins. Her number 4 wielded an oar no less than 15 ft. 3½ ins. long, of which 4 ft. 2½ ins. were inboard. The whole equipment, indeed, in 1829, represented the first conscious change, not merely from pleasure-craft to racing eights, but from sea-boats to the fresh-water "shell."

Three typical inventions differentiate first-rate oarsmanship in racing craft on rivers from the rowing seen in pleasure boats or on the sea; the outrigger, the

smooth and keelless hull, and the slide.

Though the first rough sketch of an outrigger was known in 1828, it was not perfected for narrow racing boats by Clasper until 1844, and the first outrigger eight in the university race appeared in 1846. The first keelless boat used for racing, made with a smooth hull of polished cedar without any overlapping strakes, was Clasper's four-oar in 1847, and Oxford used a four of this build soon afterwards. At Henley in 1856 Matt Taylor's boat for Littledeale's winning Chester eight revolutionised racing craft construction. The 1829 model of 45 ft. by 4 ft. had not only been narrowed down by the invention of outriggers, but, to secure more flotation, had grown to a length of more than 65 ft., by less than 2 ft. broad. Matt Taylor's contribution was not so much the keelless hull for eights, which Clasper had already introduced in fours, as the shortening of the length to 56 ft., and more particularly the placing of the broadest beam well forward, instead of nearly amidships, as in the old, longer models. The boat used by Oxford in 1857 was only 55 ft. long by 25 ins. wide.

The third of these typical inventions, the sliding-seat, had been foreshadowed by the practice



Rowing with sliding seat. 1. Position of hands and wrists for beginning. 2. Beginning. 3. Just after beginning. 4. Half through stroke. 5. Position at finish. 6. Hands and wrists at finish. 7. Hands dropped for feathering. 8. Arms extending on recovery. 9. Body swinging forward and carrying slide. 10. Blade beginning to turn off feather

From *The Complete Oarsman*, by E. C. Lehmann, by courtesy of Methuen & Co.

among such north country scullers as Jack Clasper or Harry Kelley, of greasing their broad, fixed thwart, and moving to and fro on it as their body swung forward and backward. The first actual slide was invented in Chicago in 1857 by an American, who was investigating a wholly different detail in the stroke, and it was first seen in a six-oar in 1870, in the United States. The extraordinary improvement introduced was speedily recognized, and the university race of 1873 was the first rowed on slides, which gave a movement about 12 ins. or less. But the true combination of slide with swing, which is the essence of the best English style, was not so quickly understood. Hanlan, the famous sculler, was its first real exponent.

Yet even to-day many crews think that the slide only substitutes leg thrust for body swing, and forget that the increased labour the slide entails must inevitably tire a man's heart and legs in a mile, if it is not rightly applied, and if it is not assisted by the weight of the body swing. A man's strength gradually evaporates with every stroke. His weight remains the same from start to finish. This is why the true style always endeavours to combine the two.

Dr. Warre, who did so much to teach this style to Britain's best oarsmen, made a scarcely less valuable contribution to the sport in elaborating a theory of boat-building from the point reached by Matt Taylor. The professional builder had proceeded, from 1857,

for more than sixty years, on a rule-of-thumb method of instructive empiricism which proved, on the whole, marvellously successful. Sims, of Putney, for instance, built the boats for each university in the race of 1903, for crews averaging over 12 stone. They had a length of 63 ft., with a beam of 23½ ins., and a depth of 9½ ins. amidships; and the boat he designed for Cambridge against Harvard in 1906 weighed 277 lb., and carried over 1,500 lb. Neither he nor any of his successful contemporaries could give any real reason for these dimensions, and their master section was usually placed at a distance from the bow, representing 5-12ths of the whole length, leaving 7-12ths for tapering towards the stern. Sometimes their boats were fast, but this was not always the case.

Clearly it was necessary to try to arrive at some theory or formula which would at least prevent obvious error, and might lead to unexpected improvement. At first the yacht builders had their say; but they could contribute nothing useful to the theory of a racing eight, except the valuable fact that a boat at twelve knots, the pace seen in a race at Putney, must experience a resistance of skin-friction in the water, of a pound to every square foot of immersed surface. No other boat-builder has to face the problem of a dead-weight of 400 lb., with a motive power weighing over 1,400 lb., which not only swings to and fro, but moves 16 ins. or more backward and forward in each stroke.

It was therefore fortunate that Dr. Warre should have taken up Matt Taylor's model for investigation. He satisfied himself that slides did not produce sufficient longitudinal oscillation to justify any length over 60 ft. He propounded the proportion of $\frac{1}{3}$ to $\frac{1}{4}$ in a 56 ft. hull as the right indication for the master section, which put the broadest beam (27 ins.) well forward, 21 ft. from the cutwater, with a fine entry, bluff bows, and lines that tapered delicately from number three's stretcher to the stern; and he suggested the "twin-circle" theory for designing the curves of the hull. But even with Mark Barr's additions, this theory remained incomplete.

The matter was submitted to the astronomer-royal, Sir W. Christie, who put forward the theory of the involute of the circle. By the unwinding of the thread from a suitable reel of cotton (of 6½ inches diameter for a full-sized design, or 1½ inches diameter for a one-quarter size), the pencil at the

end of the thread produces a very beautiful curve, from which every section of a racing eight from bow to stern can be graphically drawn, and, by the use of templates, practically set out, even by anyone entirely ignorant of the mathematical principles involved. The one later development was in 1936 the introduction into the building of an eight of cross beaming in order to strengthen it. Sims's eights in 1948 had roughly the same dimensions as in 1903—60 ft. to 62 ft. total length, 23½ ins. beam.

Changes in the Oars

Oars have changed almost as much as boats—from more than 15 ft. long in 1829 to less than 12 ft. at the Henley regatta of 1919—if only winning crews are considered. In 1876 Brickwood records they were about 12 ft. 9 ins. In yet earlier years Woodgate said that out of 25 parts, seven were considered right for the proportion inboard and 18 outboard; and he continued to advocate a length of 12 ft. 6 ins., or more, as the most effective. This length was used by the New College crew of 1897.

Such long oars, however, tend to take charge of a man, instead of leaving him in full control. They imply more windage, and they also involve a slower stroke and a narrower blade. It is probable also that their blades tend to enter the water at an angle of less than 45° to the boat's side, which pinches her instead of driving her forward. For Putney, and for the University race of 4½ m., in which anything over a rate of 36 strokes to the minute is rarely seen and under 30 is a frequent average, they may be more successful than at Henley, where crews start at over 40 and stay as near that pace as possible. R. C. Lehmann's most speedy Leander crews (from 1891 to 1896) won with oars of a total length of 12 ft. (or at most 12 ft. 2 ins.), with 3 ft. 8 ins. inboard, and blades 2 ft. 7 ins. long by 6 ins. broad. Many winning Leander crews between the First and Second Great Wars used 12 ft. 3 in. oars with a 5½ in. blade and 3 ft. 8½ in. or 3 ft. 9 in. inboard. Tideway crews favour an oar of a total length of 12 ft. 1 in. with a 6½ in. to 6¾ in. blade and 3 ft. 8½ in. to 3 ft. 9 in. inboard. The weight of an oar should be less than 8½ lb. for Henley; but heavier oars have been used at Putney.

After the boat and oars comes the question of rig. Whereas before 1921 the measurement between the centre of the seat and the centre of the thole or swivel was

normally 30½ ins., the tendency after that was to increase it, sometimes to as much as 32 ins., with an average of 31½ ins. The rowlocks, in which the oars rest, should be 6 ins. or less above the seat, depending on the floatiness of the boat. The seat itself should be not more than 8½ ins. above the level of the oarsman's heels. The lower the oarsman can sit above his heels the better. Most men of ordinary suppleness can manage 8½ ins. Thames rowing club has been successful with 7½ ins., and the fine Swiss crews of the 1930s had measurements of less than 7 ins. The instrument devised by Col. W. A. L. Fletcher is the best for examining these details. Although Dr. Warre disapproved of "camber," the curve which brings the bow and stern of an eight higher out of the water than her middle, all boats came to be built with it.

In an eight, fixed rowlocks were generally used, and continue to be by both university crews and by Leander club. The majority of clubs, however, changed to swivels, and few of any foreign crews retained the fixed rowlock. Opinion differs as to which is the better for an eight. Swivels are used for fours, pairs, and sculling-boats. Of these last it is only possible to give average measurements and to suggest that the rigger-spread should be 5 ft., the length about 26 ft., the beam about 10½ ins., with a depth of about 6 ins. for a man under 12 stone. Sculling has, in the race for Doggett's Coat and Badge, a longer continuous history than any other form of watermanship, and at its highest, in the Diamonds or the Wingfield sculls, the amateur championship, it necessitates a finer combination of delicacy with endurance, and a longer period of practice, than any other sport of the kind.

Methods of Teaching

The art of rowing can be learnt only on the water, with the help of an experienced coach and by covering long distances. The ideal which all oarsmen strive to attain but few reach is to catch the beginning from the stretcher, to throw the weight from the feet on to the blade at the same time as the legs begin to shove the slide back, and to finish the body-swing exactly as the slide reaches the back stops.

In the process of learning crews rarely attain much speed. The old method of teaching was to get the oarsman to go through the motions correctly. In the early 1920s Steve Fairbairn initiated a

new approach to rowing. All thought at first had to be focused on driving the slide back with the legs; the blade became "rowed in" to the water. The theory was based on the fact that the point of greatest effectiveness in the stroke is when the loom of the oar has almost reached a position at right angles to the side of the boat. The portions of the arc on either side of this point produce less and less effective work as they approach the side of the boat at each end of the stroke. Thus, assuming the blade is wide enough to avoid "slip," the eight oars would strike the water a blow at the most effective point. This method was widely adopted, and undoubtedly produced higher speeds among average crews. Criticism was levelled at it, on the grounds that it produced fewer first-class oarsmen, and therefore fewer first-class crews.

Any reader interested in styles of rowing should visit an Olympic regatta where any number of different ways of rowing can be seen, many of them very effective. He will come away probably with the idea that there are three cardinal principles: the blade must be anchored in the water; the stroke must be driven through by the legs from the stretcher; these two essentials must take place perfectly together. No races, however, will be won unless the oarsmen are fit, and prepared to row hard over the whole course.

Bibliography. Records of Henley Royal Regatta, 1839–1902, H. T. Steward, 1903; *The Complete Oarsman*, R. C. Lehmann, 1908; *On the Grammar of Rowing*, Dr. E. Warre, 1909; *The Record of the University Boat Race, 1829–1909*, C. M. Pitman, 1909; *Rowing at Henley*, Sir T. A. Cook, 1919; *Rowing Notes*, S. Fairbairn, 1926; *University Boat Race Official Centenary History, 1829–1929*, G. C. Drinkwater and T. B. Sanders, 1929; *Henley Records, 1919–1938*, C. T. Steward, 1939; *The Rowing Almanac*, published annually.

Rowland, HARRY AUGUSTUS (1848–1901). American physicist. Born at Honesdale, Pa., Nov. 27, 1848, and educated at Rensselaer Polytechnic Institute, Troy, he was appointed professor of physics at Johns Hopkins university, 1876, a post he held until his death, April 16, 1901. Rowland was one of the most brilliant American physicists of his century. His diffraction gratings used in spectroscopy were a great advance on previous instruments of this type. The determination of the mechanical equivalent of heat, of the

value of the ohm and other electrical constants, and his discovery of the magnetic effect of electric convection attest his high powers. He wrote *Studies on Magnetic Distribution*, 1875; *On a Magnetic Effect of Electrical Convection*, 1876; *Research on the Absolute Unit of Electrical Resistance*, 1878; *On the Mechanical Equivalent of Heat*, 1880; *On Concave Gratings for Optical Purposes*, 1883.

Rowlandson, THOMAS (1756–1827). Jewish caricaturist. Born in Old Jewry, London, he studied at Barrow's academy in Soho, the R.A. schools, and in Paris. Until 1780 he painted and exhibited landscapes, portraits, and history in the grand manner; but his faculty for caricature had already displayed itself, and after 1787 he produced nothing else. The Westminster election of 1784 brought him into notice as a political satirist; the "delicate investigation" of 1809 into the conduct of Princess Caroline, and popular feeling against Napoleon, gave him further opportunities of exercising his art. Most of these drawings



Thos. Rowlandson
Self-portrait

for public consumption are crudely coloured and coarse, even according to the standard of the time. He is seen to greater artistic advantage in *Three Tours of Dr. Syntax*, with text by William Combe, which appeared in *Ackermann's Poetical Magazine*, the nucleus of a fine series of colour books. Rowlandson was a big handsome man and an inveterate gambler. He died in London, April 22, 1827. In 1945 a drawing by Rowlandson, *A Night at the Old Vauxhall Gardens*, was discovered in a Walthamstow antique shop and purchased for £1; it was later sold at Christie's for 2,600 guineas. This drawing, shown at the R.A. in 1784, was identified from contemporary engravings. See *Caricature. Consult R. the Caricaturist*, J. Grego, 1880; T. R.: *His Drawings and Water-Colours*, A. P. Oppé, 1923.

Rowlatt, SIR SIDNEY ARTHUR TAYLOR (1862–1945). A British lawyer. Born July 20, 1862, he was educated at Fettes and King's College, Cambridge, and was called to the bar in 1886. In 1900 he became junior counsel to the inland revenue, transferring to the Treasury in 1905. In 1908 he was chairman of the committee dealing with criminal conspiracies in India; his work led to the Rowlatt Act, designed to strengthen the powers of the government in putting down revolutionary crime. Rowlatt was made a knight and a judge in 1912. He was chairman of the commission on betting, 1932, and of the general claims tribunal during the Second Great War. He died March 1, 1945.

Rowley, WILLIAM (c. 1585–1642). English dramatist. Greatly in request as a collaborator, he was associated with Massinger, Middleton, Heywood, Ford, Dekker, Webster, and, possibly with Shakespeare. He joined the king's servants in 1623, and retired 1627. Rowley claimed sole authorship of four plays, of which *A New Wonder*, 1632, was declared to be his best work.

Rowley Manuscripts. Literary fabrications by Thomas Chatterton. This boy, who began to write at 10, had access to old parchments from the muniment room of the church of S. Mary Redcliffe, Bristol, of which his uncle was sexton. This led him to fabricate poems and prose fragments which he attributed to ancient sources. His first conception of the Rowley Romance dated from 1765 when he was thirteen; its central figure was an imaginary monk of the 15th century, Thomas Rowley. Milles, president of the Society of Antiquaries, published in 1782 an edition of the Rowley poems. Definite proof that these were the work of Chatterton was not forthcoming until in 1871 their spuriousness was established by Skeat.

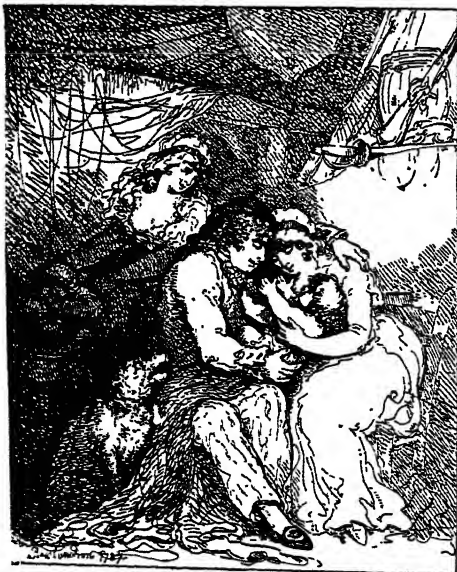
Rowley Regis. Mun. bor. and market town of Staffs, England. It is near the Stour, 5 m. W. of Birmingham, served by rly. and canal. Surrounded by coal mines, it has ironworks, potteries, and works for the manufacture of chains, etc. It shares an M.P. with Tipton. Market day, Sat. Pop. 41,238.

Rowntree, BENJAMIN SEEBOHM (b. 1871). British social worker. Educated at the Friends' school, York, and Owens College, Manchester, he entered his father's chocolate business, becoming a director, and was chairman 1925–41. He was made C.H. 1931. A prominent social and Liberal worker. He was chairman of the Nat. Inst. of Industrial Psychology, and a trustee of the Nuffield Trust. He wrote *Poverty, a Study of Town Life*, 1900; *Unemployment*, 1911; *The Way to Industrial Peace*, 1914; *The Human Factor in Business*, 1921, rev. ed. 1937; *Poverty and Progress*, 1941.

Rowse, ALFRED LESLIE (b. 1903). English historian. A Cornishman, he was born Dec. 4, 1903, and educated at St. Austell. A scholar of Christ Church, Oxford, he transferred to Merton College as a lecturer in 1927, and during 1931–35 taught at the London School of Economics. Love of the Tudor period, a spirited local patriotism, and a preference for the form of the historical essay were shown in his writings. *Tudor Cornwall*, 1941, and a study of Sir Richard Gren-



B. S. Rowntree,
British social worker



Thomas Rowlandson. One of the artist's most delicate drawings, entitled *A Sailor's Family*

ville, 1937, contained original work; *The English Spirit*, 1944, and *Essays of a Decade*, 1947, were attractive collections. His bitter, honest autobiography, *A Cornish Childhood*, 1942, was the most discussed book by Rowse, who was also a poet, and a controversialist originally of Left-wing sympathies, later veering towards the Right.

Rowton, MONTAGUE WILLIAM LOWRY-CORRY, BARON (1838–1903). British politician. He was



Baron Rowton,
British politician
Elliott & Fry

born Oct. 8, 1838, and educated at Harrow and Trinity College, Cambridge, being called to the bar in 1863. His father, Henry Corry, was first lord of the Admiralty under Derby in 1867–68, and in 1866 Montague became private secretary to Disraeli. He retained that position until Beaconsfield's death, at which the Tory leader left him all his papers. In 1880 he was made a baron. He is known as the founder of the Rowton Houses (*q.v.*). Rowton died unmarried and without an heir Nov. 9, 1903.

Rowton Heath. Open space in Cheshire, England. It is 3 m. S.E. of Chester. Here on Sept. 24, 1645, the forces of Charles I were defeated by the parliamentarians. The king had just entered Chester, pursued by a body of horsemen under Sedenham Poyntz. On Rowton Heath the latter engaged and routed a detachment of the royalist cavalry. *See* Civil War.

Rowton Houses. Buildings designed to provide comfortable and cheap lodgings, the amenities of club and hotel life, to single men. The scheme was devised by Lord Rowton, and the first house was erected at his own cost in Bond Street, Vauxhall, with accommodation for 477 persons. It was opened Dec. 15, 1892, and its success, financial and social, was such that in 1894 a company was formed with Lord Rowton as chairman to extend the work. Between 1896 and 1910 similar institutions were opened in London at King's Cross, Newington Butts, Hammersmith, Whitechapel, and Camden Town (total accom. 4,000). The welfare club has obtained numerous successes in billiards and draughts; in 1948 both the British and world champions in draughts were residents at the Camden Town house. W. H. Davies (*q.v.*) lodged for two years in a Rowton house

while trying to start his literary career.

Roxana. Daughter of the Bactrian prince Oxyartes and wife of Alexander the Great. Her son, Alexander Aegus, born after his father's death, was acknowledged as the future king, and taken by his mother to Pydna in Macedonia, where she became intimate with Alexander the Great's mother Olympias. During the struggle for supremacy among the successors of Alexander, Pydna was captured by Cassander and Olympias put to death, Roxana and her son being removed to Amphipolis, imprisoned, and murdered by Cassander's orders in 311 B.C.

A Latin tragedy called *Roxana*, by W. Alabaster, was produced at Cambridge, about 1592, printed 1632, and praised by Dr. Johnson. *Roxana* is also the name of one of the principal characters in Nat. Lee's tragedy, *The Rival Queens*, or *Alexander the Great*, 1677. The full title of the romance by Defoe, usually called *Roxana*, is *The Fortunate Mistress*; or, *a History of the Life and Vast Variety of Fortunes of Mlle. de Belau*, afterwards called the Countess of Wintellsheim in Germany; being the Person known by the Name of Lady Roxana in the Time of King Charles II, 1724.

Roxburgh. Former town of Roxburghshire, Scotland. The burgh stood near where Kelso now stands, at the junction of the Teviot and the Tweed, and gave its name to the county. There was a castle here in the 11th century, and this, made into a great



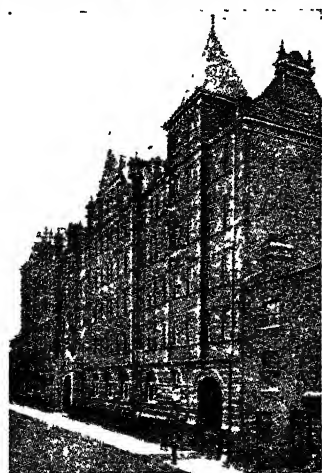
Roxburgh, Scotland. Ruins of the castle at the junction of the Tweed and Teviot

fortress, was a favourite residence of the Scottish kings. Around it the town grew until it was one of the most important in Scotland. It had a church, court of justice, mint, and grammar school. The castle was besieged and taken several times by the English, James II being killed at one siege in 1460. Soon after this it began to fall into decay and it was finally dismantled in the 16th century. The town gradually became smaller until today nothing is left of it. A fair is held on the site on Aug. 5 every year. About 2 m. away is the village of Roxburgh, or New Roxburgh, with a rly. station. Pop. 698.

Roxburgh. Town of Otago, New Zealand. It is a borough on the Molyneux river, 100 m. N.W. by rly. from Dunedin. Fruit-growing is the main occupation of the neighbourhood. Pop. 479.

Roxburgh, WILLIAM (1751–1815). British botanist. Born at Craigie, Ayrshire, June 3, 1751, he was educated at Edinburgh. He entered the medical service of the East India Company and went to India, where he studied the flora, becoming in succession the Company's botanist and, in 1793, superintendent of the Botanic Gardens, Calcutta. He published *Plants of the Coast of Coromandel*, 1795, and *Hortus Bengalensis*, 1814. Roxburgh died at Edinburgh, Feb. 18, 1815. His *Flora Indica* was published in three vols., 1832.

Roxburghe, DUKE OF. Scottish title borne since 1707 by the family of Ker. Robert Ker, who was a leading member of a famous



Rowton Houses. The frontage of the institution at Camden Town, London



John, 1st duke of Roxburghe, Scottish statesman

Border family, was made earl of Roxburghe in 1616 by his friend James I. By special arrangement this title passed on his death to his grandson, William Drummond, who took the name of Ker, and his descendant John became the 5th earl in 1693. He was secretary of state for Scotland, and, having helped to bring about the union of the two kingdoms in 1707, was in that year made a duke. He was secretary for a period after the union.

John, the 3rd duke, formed a famous and valuable library, sold in 1812, and gave his name to the Roxburghe club. He died in 1804, and in 1805, when his cousin died, the titles appeared to become extinct.

However, in 1812, they were successfully claimed by Sir James Innes, Bart., a descendant of the 1st earl; he took the name of Innes-Ker, and from him the later dukes are descended, George Victor Robert John Innes-Ker (b. Sept. 7, 1913) becoming the 9th duke in 1932. Their chief seat is Floors Castle near Kelso, and the duke sits in the house of lords as Earl Innes, a title dating from 1837. His eldest son is known as marquess of Bowmont.

Roxburghiaceae. Small family of twining shrubs. Natives of Asia, Australia, and Florida, they have tuberous roots, leathery leaves, and large, showy flowers. There are only a few species, distributed in three genera: Crocmitia, Stemonia, and Stichoneuron. The tuberous roots of stemonia, after preparation with lime-water, are candied, but have little flavour.

Roxburghshire. Border county of Scotland. Its area is 666 sq. m., and it is sometimes called Teviotdale after the name of its chief river. The Tweed and Liddel also give their names to beautiful dales here, while smaller streams include the Gala, Ale, Jed, and many others. The surface is hilly in the S.E. where are the Cheviots, one peak rising to 2,382 ft., and in



Roxburghe
(3rd Duke)

After W. Hamilton



Roxburghshire. Map of this Scottish border county, N.W. of the Cheviot Hills

Jedburgh can show the houses where Mary Queen of Scots lay ill in 1566; where the Young Pretender lodged in the '45; where Robert Burns stayed when made a burgess of the town in 1787; and where Scott visited Wordsworth and his sister, and read to them part of the Lay of the Last Minstrel.

the N. where the Eildon Hills enter the county. Much land is devoted to grazing more than half a million sheep, while tweeds are manufactured. The rivers are noted for their fishing. Jedburgh is the county town; other towns are Hawick, Kelso, Melrose, and St. Boswells. With Selkirkshire it sends one member to parliament. The county is full of scenes of beauty and historic interest, the latter due, in part, to its position as a Border county. The castles or peel towers include Ferniehurst, Branksome, Harden, Hermitage, and others celebrated in song and story, while there are abbey ruins at Melrose, Jedburgh, and Kelso. There are fine examples of hill-forts. The Romans had stations in the district, which was made a county about 1160. Pop. 45,200.



Roxburghshire arms

Roxburghshire shared in the ballad and other literature that commemorates the history and romance of the district.

Sir Walter Scott spent his early years at Sandyknowe, near Smalholm Tower, and attended the grammar school at Kelso, where he first met James Ballantyne. Abbotsford was for a long time his home. The scenes of many of his poems and novels are laid in the county. Branksome or Branksome Tower is described in *The Lay of the Last Minstrel*; in the churchyard of the present village of Roxburgh is the grave of Andrew Gemmels, the original of Edie Ochiltree in *The Antiquary*; Bridgend, near Melrose, is described in *The Monastery*.

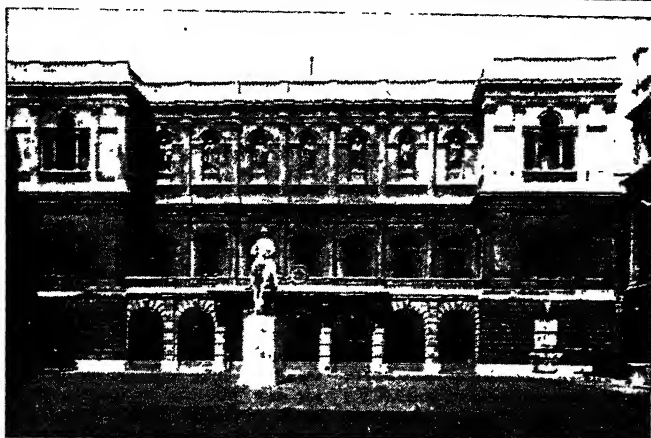
In Melrose Abbey is the reputed grave of Michael Scott, and in the neighbourhood is the Eildon tree, where Thomas the Rhymer met the fairy queen. Sir David Brewster, who was born at Jedburgh, lived at Gattonside. William Turnbull (d. 1454), bishop of Glasgow and founder of Glasgow university, is described as a native of the county; Samuel Rutherford (1600-61), principal of St. Mary's College, St. Andrews, was born at Nisbet, now Crailing; Mary Somerville, the mathematician, at Jedburgh; John Leyden at Denholm, and Jane Elliot at Minto, Teviotdale. Ednam is the birthplace of James

Thomson, who was educated at Jedburgh. Consult *Minstrelsy of the Scottish Border*, Sir Walter Scott, 1839; *Roxburghshire*, Sir G. Douglas, 1898; *Highways and Byways in the Border*, A. and J. Lang, 1913.

Roxbury. Place-name applied to many towns and villages in the U.S.A. The largest of these places, the former city of Roxbury, or Boston Highlands, has been since 1868 a S.W. suburb of the city of Boston, with a frontage on Massachusetts Bay. It was founded by the Puritans in 1630 and received a city charter in 1846. The Roxbury Latin School was founded as the "Free School in Roxburie" about 1644, and endowed by Bell in 1671. In 1841 W. Roxbury was the scene of the Brook Farm experiment, from which leading figures in 19th century American literature arose. C. A. Dana, Nathaniel Hawthorne, and Emerson all took part. The buildings were burned in 1846 and the farm sold in 1849. Here are hospitals and other similar institutions and factories for textiles, cordage, carpets, and shoes. Other places of this name are in the Catskill mts., New York state (pop. est. 2,000); and on the Shepang river, Conn. (pop. est. 1,000).

Roy, WILLIAM (1726-90). British soldier and archaeologist. Born in Lanarkshire on May 4, 1726, he was educated at Lanark grammar school, and in 1746 was employed on the Marshal Wade road-making works in the Scottish Highlands. His work secured him an army commission, and he rose to lieutenant-colonel's rank by 1762, seeing active service at Île d'Aix, 1757, and in Germany, 1759-61. In 1765 he became surveyor-general of the coasts and carried out many important fortifying works. Major-general, 1781, director of Royal Engineers, 1783, he died in London, July 1, 1790. He left many valuable accounts of his archaeological researches into Roman military works in Britain.

Royal (Fr. *roi*, king). Belonging to a king or queen. It is borne by a large number of societies as a mark of honour, and is prefixed to official bodies created by the sovereign, e.g. royal commission, royal courts of justice. Most of these are placed in this Encyclopedia under their distinctive names, e.g. Commission; Horticultural Society; Literature, Society of; Physicians, College of. In one or two cases, however, the word royal is the dominating one, and such entries, e.g. Royal Academy, Royal Air Force, Royal



Royal Academy. Burlington House, Piccadilly, London, where the Royal Academy exhibitions are held. The buildings shown are part of the original mansion of Richard Boyle, third Earl of Burlington, built in 1695-1743

Family, Royal Institution, and Royal Society, appear under the word royal. So do the various army corps which were honoured with the prefix Royal before Dec., 1946. But regiments so designated, e.g. county regiments, are described under their topographical or other designations.

Royal Academy of Arts. British art institution. It was founded Dec. 1, 1768, by George III, the royal "instrument" providing for the appointment of a president and forty Academicians, and for the holding of annual exhibitions. The Academicians were to include professors of all branches of the fine arts, thus inaugurating the educational side of the Academy's activity now represented by the Academy schools. In 1769 a class of 20 associates and six "associate-engravers" was created, the latter not being for several years made eligible for full Academic rank. At the present time these numbers are maintained at about the original figures, though the classes of "honorary retired" Academicians and associates and "honorary foreign" Academicians swell the aggregate.

In 1780 rooms in Somerset House were assigned to the Academy. In 1834 it was removed to Trafalgar Square, and in 1869 to Burlington House, Piccadilly.

The annual exhibition opens the first Monday in May, and lasts till over the following August Bank Holiday. Academicians and associates have the right to contribute six works apiece, but the outside artist may only submit three works. In addition, a winter loan exhibition of Old Masters is usually held at the galleries for a few weeks at

the beginning of the year. Included in the R.A. premises is the Diploma Gallery, so called from the fact that it consists of works presented by successive Academicians on their election, this event being signalled by the receipt of a diploma signed by the monarch. The administration of the Chantrey Bequest is vested in the president and council. See Academy; Chantrey, Sir F. Consult The Royal Academy and Its Members, 1768-1830, J. E. Hodgson and F. A. Eaton, 1908; *The Inner Life of the Royal Academy*, G. D. Leslie, 1914; *The Royal Academy*, W. R. M. Lamb, 1935.

Royal Aeronautical Society. British institution for the study and encouragement of aeronautics. Founded in Jan., 1866, as the Aeronautical Society of Great Britain, it is the oldest institution of its kind in the world having an unbroken record. The society first met on June 27, 1866, under the presidency of the duke of Argyle, and the opening paper read, *Aerial Locomotion*, by F. H. Wenham, which laid down the principles of mechanical flight, became a classic. In 1868 the society organized the first aeronautical exhibition, and later undertook research into aerodynamic theory, and built the first wind tunnel. In 1927 it amalgamated with the Institution of Aeronautical Engineers. Gold and silver medals are awarded for aircraft design and flying skill. The society's h.q. are at 4, Hamilton Place, London, W.1. Branches in the U.K. and in Australia and Canada. Its library of aeronautical literature is extensive.

ROYAL AIR FORCE: ORIGIN & DEVELOPMENT

G. D. H. LINTON, Former Lecturer to Army and R.A.F.

This contribution traces, from its origins in the First Great War, the history of Great Britain's third fighting service. Related articles deal with Air Defence; Air Fighting; Air Raids; and Air Warfare; with Bomber Command and other air formations; with specific aircraft, e.g. Hurricane; Spitfire; Wellington; and with the war commanders of the R.A.F., e.g. Harris; Portal; Tedder. For insignia of the service, see Rank illustration

Not until the First Great War had entered what proved to be its final year, 1918, was the long-urged step taken of merging the Royal Flying Corps and the Royal Naval Air Service into one independent fighting body—the first of its kind in any country. The effective date was April 1, and the creation of the Royal Air Force (commonly abbreviated to R.A.F.) caused an immediate improvement in administration; no longer did the War Office and the Admiralty compete for deliveries from the manufacturers. The system of directing the R.A.F. by means of an air council, with the secretary of state for Air and his under-secretary (both civilian ministers) representing the government of the day, and the chief of the air staff heading the service members, was also introduced early.

Strength in 1918

The young R.A.F. enjoyed an ever-growing mastery of the air on all fronts, and at the time of the armistice (Nov. 11, 1918) its strength in personnel was 27,333 officers and 263,410 other ranks, and in aircraft 22,647 aeroplanes and 103 airships, grouped in 188 operational squadrons—by far the largest air force in the world. By 1922, the effective strength had been reduced to 32 squadrons, composed of 350 first-line aircraft, 20 of which were kept overseas by imperial commitments (always an important factor in British air strategy). This reduction in the strength of the R.A.F. forced many aircraft factories to close; others barely existed on token orders for new equipment and replacements. But the R.A.F., under its creator, Sir Hugh Trenchard (*q.v.*), was kept at a high standard of training and efficiency and found in succeeding years in such areas as the N.W. frontier of India, Iraq, and Aden opportunities for active police and patrol work, and provided evidence of the value of air transport.

While Trenchard, first to attain the highest of the newly instituted R.A.F. officer ranks (air marshal, then air chief marshal, finally marshal of the R.A.F.), was still chief of the air staff, the achievements of the R.A.F. overseas in-

cluded the inauguration, 1921, of a regular air mail service between Bagdad and Cairo, and, 1928, the evacuation of 586 persons from the Afghan capital, Kabul. The "shop-window" of the R.A.F. at this period was the pageant (later termed display) at Hendon, held annually from 1920 to 1937; this was for a time replaced by Empire air day, but was revived in 1950, at Farnborough. Annual exercises were also a feature of training.

The air council realized, too, the value both to home manufacturers and pilots and in international prestige of success in world record attempts. The speed triumphs of the Supermarine seaplanes successful in the Schneider trophy races of 1927, 1929, and 1931, the long-distance record (5,340 m.) of the Fairey monoplane in 1933, and a number of alt. records were achieved by serving R.A.F. pilots.

The broad division of R.A.F. aircraft into fighters for home defence, bombers for offence, and reconnaissance aircraft (including seaplanes) for long-range coastal patrol, etc., was gradually evolved, as was grouping into squadrons (the smallest operational unit, usually 9–12 aircraft in two or three flights); two or more squadrons forming a wing; and a number of wings, a group. Each aerodrome or site of a R.A.F. establishment became a R.A.F. station, accommodating perhaps a number of squadrons, but also having its own h.q. staff, including commanding officer, adjutant, and station warrant officer. The highest formations were at first termed areas (inland area, fighting area, Wessex bombing area, etc.), and it was not until expansion came in the late 1930s that operational grouping into commands (Bomber Command, and so on) became the practice. Overseas, R.A.F. India, R.A.F. Middle East, etc., were geographical groupings.

Divided Control

Although the independence of the R.A.F. was never challenged, the correct relationship with the other two services where their work was closely linked remained a source of controversy until the test of war showed the answer. For many years, there were army co-

operation squadrons in the R.A.F., manned by the latter service and equipped with short-range two-seater utility aircraft. The Fleet Air Arm (*q.v.*), formed in 1924 as a seagoing branch of the R.A.F., was rather unhappily wedded to the navy; the Admiralty retained control even of the seconded R.A.F. crews while the units were afloat, but not when the carriers put in and the aircraft were flown off to land. This system existed until 1937, when the Admiralty assumed complete control, and the service (later called Naval Aviation) became an entirely naval responsibility. The "general reconnaissance" harbour-based flying boats—some of them of considerable range—remained a R.A.F. charge. British experience of large airships was unhappy, and with the loss of R.101 (*q.v.*) in 1930 development of lighter-than-air machines ceased.

Pre-War Expansion

In 1935, when there were only 40 squadrons for home defence, events in Europe forced a change in govt. policy; expansion and rearmament to raise the U.K. from her position as a poor fifth amongst the world's air powers then began. At that time the normal training of the future officer pilot (*n.c.o.* aircrew were still exceptional) at the Royal Air Force College, Cranwell, lasted two years, and even the numbers who qualified for short-service commissions failed to bring the total to what was required. Various classes of reserve were therefore built up. One of these, the Auxiliary Air Force (A.A.F.), had been formed in 1925; but its squadrons of "week-end airmen" now came to include the balloon barrage, as well as bombing and fighting units.

A notable innovation was the R.A.F. Volunteer Reserve (formed in 1936), in which civilian aircrew were trained at the government's expense at civil "elementary and reserve flying training schools," on undertaking to give their services in the event of emergency. When war did come, the R.A.F.V.R. became the normal method of entry for new aircrew recruits, with basic training at an "initial training wing" preceding that at the E.F.T.S.

In 1937, there were 120 squadrons in home commands, 20 overseas, and 20 in the Fleet Air Arm. This provided a total of 2,500 first-line aircraft. A considerable contribution to the manpower required was made by the revival in 1939 of the Women's Auxiliary Air Force (*q.v.*), releasing many men for more active duty; and later with the official adoption of the Air Training Corps as recognized pre-entry training for the R.A.F. (A.T.C. began as Air Defence Cadet Corps in 1938).

The period of expansion coincided with the introduction into service of radically new types of military aircraft. The open-cockpit biplane was being supplanted by monoplanes with retractable undercarriage, landing flaps, variable-pitch propeller, multiple machine-guns, and other refinements. The manufacture of Hurricanes, Spitfires, Blenheims, and Wellingtons required a new technique just as did their flying. Motor manufacturers were persuaded to set up "shadow" factories for the production of both aircraft and aero-engines, sub-contracting and decentralisation were organized, and an industry was built up of such proportions that in 1940 the ministry of Aircraft Production (*q.v.*) was set up to deal with it.

In the Second Great War the R.A.F. went into offensive action on the day Great Britain declared war (Sept. 3, 1939). Daylight raids proved costly, and night raiders were rarely called upon in the early months to drop anything except propaganda pamphlets. Regular patrols and convoy escort, however, were instituted by Coastal Command, with the hunting of U-boats on the sea approaches to the U.K. and far out over the Atlantic their chief concern.

A new command, British Air Forces in France, was set up in Jan., 1940; at the same time the Empire Air Training Scheme (*q.v.*) permitted large-scale training in areas unaffected by blackout or threat of siege. In April came the German invasion of Denmark and Norway; in May came the German invasion of the Low Countries; in June the declaration of war by Italy and the defeat of France. R.A.F. Fighter Command won the Battle of Britain (*q.v.*); Bomber Command in growing strength went out to attack German industry and transport; Coastal Command never ceased its less spectacular

work, both offensive and defensive. R.A.F. Middle East came into the picture, with the fluctuating fortunes of the North African Campaigns (*q.v.*).

New United States aircraft, supplied first on "cash-and-carry" terms and later under lease-lend (*q.v.*), were brought across both N. and S. Atlantic by Ferry Command, R.A.F., later merged into Transport Command.

The Japanese attack on Pearl Harbour (Dec. 7, 1941) brought the U.S.A. and her huge air potential into the war on the Allied side, but added the Far East and Burma to the R.A.F.'s battle fronts.

The principle of integrated inter-Allied commands was accepted, and the Mediterranean Allied Air Forces, Air Command South-East Asia, and the Allied Expeditionary Air Force were all inter-Allied bodies. All included both strategic and tactical components—the A.E.A.F. for the invasion of W. Europe in 1944 having under command from the R.A.F. the 2nd Tactical Air Force (T.A.F.) and units of Fighter Command. All the dominion air forces, the organization and training of which (with the single exception of the South African Air Force) were modelled closely on that of the R.A.F., also took part in the A.E.A.F. As an example of the work carried out, the 2nd T.A.F., formed for close support of the ground forces, carried out 214,169 sorties, and dropped 38,397 tons of bombs in the year 1944, losing 1,672 aircraft and their trained crews in these operations.

The development of airborne forces called into being the Army Air Corps; parachutists and glider pilots were trained by the R.A.F.; R.A.F. crews manned the glider tugs, and in many cases piloted the gliders into action.

Wartime developments in home R.A.F. organization were the division of Training Command into Flying Training and Tech-

nical Training Commands, and the formation of Army Cooperation Command (later disbanded), Maintenance Command (at one time having the most personnel), Balloon Command, which took part in the invasion of Europe as well as in home defence, and the Royal Air Force Regiment (*q.v.*). The Royal Observer Corps, though of military standard in efficiency, and operating under H.Q. Fighter Command, remained a civilian body (*see* Observer Corps, Royal).

Two new branches of R.A.F. activity were the P.R. (photographic reconnaissance) units, provided with specially equipped high-speed long-range aircraft, and Air-Sea Rescue, which used both aircraft and surface vessels for lifesaving work.



Royal Air Force. Left, First Great War officer of the R.F.C., in captain's uniform. Centre, a squadron leader of the R.A.F., and right, uniform of a R.A.F. aircrewman

The scientific advances of the war years were many and significant. The most notable was the introduction of Radar (*q.v.*), at first for the defence of the U.K., later for seeking out and destroying U-boats, and for precision bombing. Jet propulsion (*q.v.*) did not come to fruition until the last year of hostilities—too late to affect the course of the air war.

The R.A.F. was the first air force to use huge high-explosive missiles of 4 up to 10 tons in weight. The war-saving British aircraft were the Spitfire and the Hurricane; the war-winners were the Mosquito light bomber and the Lancaster and the Halifax "heavies." Armament developed from the single .303 machine-gun to the

60-lb. rocket projectile and the remote-controlled multi-gun power-operated turret.

After the surrender of Germany in 1945 an R.A.F. command called B.A.F.O. (British Air Forces of Occupation) was set up in British-occupied Germany; strength in other overseas theatres was concentrated under H.Q. MEDME and H.Q. South-East Asia Air Forces (later called Air Command, Far East). At home, the wartime framework continued, with the addition of Reserve Command, revived from pre-war days to embrace the newly honoured Royal Auxiliary Air Force (including Fighter Control Units and Royal Auxiliary Air Force Regiment), the R.A.F.V.R., the A.T.C., and the University Air Squadrons.

In 1944, production peak year of the war, the aircraft factories and their associates formed the largest of all British industries, producing 25,453 aircraft (plus 1,472 gliders) in the year. With the end of the war, there was an immediate drop in aircraft production; and all except regular airmen were gradually released to civilian life. The strength of the Royal Air Force in the 1950-51 estimates was 198,000. War casualties officially totalled 112,296.

After the Empire Air Training Scheme was wound up in 1945, a series of empire schools—Empire air armament school, Empire air navigation school, Empire flying school, and so on—providing liaison with the dominions and colonies, was retained until the formation, 1949, of the R.A.F. Flying College. Development of combined operations training and the study and practice of "land/air warfare," also continued.

Post-War Conditions

Officers for aircrew duties were commissioned as before into the general duties branch; the R.A.F. college was reopened, and wider opportunities than before were offered to potential officers. Candidates for entry to Cranwell must be between 17½ and 19; the course lasts about 2½ years, and on its successful completion cadets are given their "wings" and commissioned as pilot officers. Short-service commissions are granted to those selected from aircrew who have enlisted for five years' regular full-time service (plus four on the reserve). Candidates must have served at least 18 months in the ranks, and are required to see out six years' regular full-time service. Officer

aircrew are also selected from the ranks of the aircraft apprentices and administrative apprentices.

The aircraft apprentice, who is usually trained at Halton, is enlisted between the ages of 15½ and 17, and undertakes to serve 12 years from the age of 18. After three years' apprenticeship, he is qualified in one of more than 80 trades, grouped according to the degree of skill involved. The newer grade of administrative apprentice offers opportunities to the clerk and equipment assistant.

Simultaneously with a revised peace-time pay code (July, 1946), Marshal of the Royal Air Force Lord Tedder, first chief of air staff appointed after the war, announced new non-commissioned aircrew ranks. These, called "enlisted aircrew," were as follows: cadet pilot, navigator, signaller (primarily a specialised radio operator), engineer, gunner (under training); pilot, etc., IV; pilot, etc., III; pilot, etc., II; pilot, etc., I; and master pilot, etc.

Another post-war trend was the upgrading in size and status of the technical branch, while the secretarial branch was instituted to replace the former accountant, and administrative and special duties. The other branches for commissioned R.A.F. personnel were equipment, aircraft control, catering, physical fitness, marine craft, provost, education, and R.A.F. Regiment; there are also medical, dental, and legal officers, and chaplains. The W.A.A.F. became a permanent service, reverting to the title used during the First Great War, viz., Women's Royal Air Force (W.R.A.F.).

Further details of entry into the R.A.F. can be obtained from the Air Ministry, Whitehall, London, W.C.2. Conditions of service with the Royal Auxiliary Air Force can be obtained from any county territorial and air force association.

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Royal Air Force College. This training establishment for R.A.F. officer cadets is described under Cranwell.

Royal Air Force Regiment. Military formation of the R.A.F. Raised in Feb., 1942, from a nucleus of ground gunners enlisted into the R.A.F. in 1940 to

assist in the protection of airfields, the R.A.F. Regiment had by Sept., 1942, taken over the light A.A. defence of all British airfields. It was organized in squadrons, each squadron being divided into infantry, armoured, and A.A. flights. These last manned the Bofors and light automatic guns near airfields; the infantry and armoured flights formed a mobile reserve to defend the airfield against parachute or ground attack. Overseas, armoured and rifle flights operated with the army in the capture of enemy airfields, while some squadrons acted as infantry. At the N. Africa, Normandy, and other Allied landings, A.A. units of the regiment were among the first troops ashore.

Following the Normandy landings, a number of A.A. squadrons were attached to armoured divisions for anti-tank work. During the flying bomb attacks on England, 51 A.A. squadrons were deployed along the S. and S.E. coasts. Squadrons of the regt. served in all campaigns of the Second Great War, earning particular distinction in the defence of Cos, and taking part in commando raids. Some were airborne.

Officers and men are paid and maintained by the R.A.F., are subject to the discipline and conditions, hold the ranks, and wear the uniforms of the R.A.F. On active service, however, khaki battle-dress is worn. The regiment's maximum strength in the Second Great War was 80,000 officers and men. It has a peace-time establishment of 19,000.

Royal Air Force Volunteer Reserve. Auxiliary organization of the R.A.F. Formed in July, 1936, for the enlistment and training of men from civil life as aircrew, it had an annual intake of 600 men until 1938, when its ranks were opened to all categories of airmen. Men received flying and ground training at specified centres, and all volunteers were recruited from their neighbourhood. Instruction was given at week-ends, and volunteers had to attend an annual course of 15 days' duration. Aircrew volunteers received a retaining fee of £25 a year and appropriate allowances while training. Until 1944, when the R.A.F.V.R. was merged into the regular R.A.F., all wartime volunteers were enlisted into this body and all temporary commissions in the general duties (flying) branch of the R.A.F. were given to men

from its ranks. The R.A.F.V.R. was re-formed on its pre-Second Great War basis in May, 1947. Insignia consist, for officers, of the letters V.R. in white metal worn on the tunic lapel, and for other ranks V.R. in worsted worn below the eagle on the tunic shoulders.

Royal and Ancient. The governing body of golf in Great Britain is described in the second paragraph of the article Golf.

Royal Aquarium. Former London place of amusement, the site of which, between Prince's Street and Tothill Street, Westminster, S.W., is now occupied by the Methodist Central Hall, opened 1912. The Aquarium, built for the Royal Aquarium and Summer and Winter Garden Society, was opened by the duke of Edinburgh, Jan. 22, 1876, and closed in 1902. It was used almost entirely for variety shows (e.g. the shooting of a woman named Zazel from a cannon in 1877) and exhibitions.

Royal Arch Masonry. System of freemasonry (q.v.). In England it is closely allied to ordinary "craft" masonry, the grand master of the Grand Lodge of England being usually also the first grand principal of the Supreme Grand Chapter of the Holy Royal Arch. Brotherhood in "craft" masonry is a condition of admission to companionship in the royal arch degree.

Royal Armoured Corps. Organization of the British army. Formed in 1938, the corps includes for administrative purposes the Royal Tank Regiment and all mechanised cavalry regiments of the line. Each separate regiment has its own badge, but all recruits



Royal Armoured Corps badge

to such regiments pass through R.A.C. training centres, wearing the R.A.C. mailed fist badge until posted to individual regiments. This badge is also worn by personnel of the R.A.C. who are on the staff of various corps establishments common to all the regiments. Regiments of the R.A.C. provide the nucleus of armoured divisions. They served in all campaigns of the Second Great War.

Royal Arms. Heraldic device of the British royal house. The first English royal arms were designed in 1068 for William the Conqueror and consisted of a

shield with two lions; in 1189 Henry II added a third lion, the device of his wife Eleanor of Aquitaine. When Edward III claimed the French throne in 1340



Royal Arms. The armorial bearings of the British royal house, borne on a shield with supporters, motto, and crest

he quartered the fleur-de-lis on the shield. In 1405 Henry IV reduced the fleur-de-lis to three in each quarter, the arms remaining thus until 1603, when James I superimposed the Scottish lion on the fleur-de-lis in the second quarter and the Irish harp on it in the third quarter. In 1689 the arms of William and Mary, a small shield bearing the lion of Nassau, were placed in the centre of the James I shield, and retained until 1707, when the English arms were superimposed on the Scottish lion in the first and fourth quarters.

When George I came to the throne in 1714, he replaced the English and Scottish devices in the fourth quarter by the arms of Hanover. In 1801 the fleur-de-lis was dropped from the royal arms and replaced by the Scottish lion in the second quarter, while the arms of Hanover were placed on a small shield in the centre, their previous place in the fourth quarter being taken by the three English lions. The shield with the Hanover arms was removed in 1837, when the present royal arms were adopted. They may be worn only by the sovereign and certain royal officials.

Royal Army Chaplains' Department. Department of the British War office responsible for the spiritual welfare of the troops. Ministers of religion had been attached to military formations in an unofficial capacity since the time of Cromwell, but the office was then often a sinecure, and few chaplains actually went on active

service. In 1796 the present department was set up at the request of Wellington.

Until the end of the First Great War, chaplains were directly commissioned by the War office, but in 1940 new regulations restricted the Royal Army Chaplains' grant of Department badge commissions to clergy nominated by their bishops. The dept. received the prefix Royal in 1919.

Army chaplains are drawn from the Church of England, the R.C. Church, the principal Nonconformist bodies, and the Jewish faith. Jewish chaplains wear the Cross of David. Army establishment regulations provide that there shall be one chaplain to every 1,100 men of each denomination. The department is directed by a chaplain-general to the forces (ranking as a major-gen.). Chaplains have been attached to all expeditionary forces, and in the Second Great War accompanied troops in all operations, including commando raids and airborne landings. They work with welfare officers.

Royal Army Dental Corps. Details of this organization of the British army will be found under Army Dental Corps, Royal.

Royal Army Educational Corps. Details of this body, responsible for education in the British army, are under Army Educational Corps, Royal.

Royal Army Medical Corps. Corps of the British army responsible for the care of all sick and wounded army personnel.



Royal Army Medical Corps badge

Little effort was made towards the medical care of troops until Cromwell formed his model army in 1645, when a physician-general was appointed to supervise the civilian doctors who accompanied the troops in the field. At the end of hostilities the doctors returned to private practice. After the standing army had been established in 1661, regimental commanders were authorised to employ and pay at their own cost a doctor for their unit, but the attention of the regimental



doctor was seldom available for the common soldier; a wounded private or N.C.O. had to rely on the charity of his comrades or local inhabitants.

Early in the 18th century a physician-general was appointed to the War office and made responsible for the medical care of troops in the field, but the small monetary grant at his disposal made impossible any large-scale provision of medical services. Army doctors were on a regimental basis, and many were not even qualified to practise. In 1796 army doctors were granted captain's commissions, and in the Peninsular War Wellington put the medical service on a more efficient basis. Later it deteriorated, and the scandals of the Crimean War led to the formation of the Army Hospital Corps, of trained orderlies. In 1873 a department was formed to select doctors for regimental duties and to train them in the branches of their profession peculiar to an army in the field. In 1884 the Army Hospital Corps became the Medical Staff Corps, and in 1898 it was amalgamated with the Army Medical Department as the Royal Army Medical Corps. This was the first administrative corps to be granted the title Royal. The R.A.M.C. was reorganized following criticism of its treatment of the sick in the S. African War. In 1921 the dental branch was set up as a separate unit under the title of Army Dental Corps (*q.v.*) and in 1946 granted the prefix Royal.

The R.A.M.C. is responsible for the health of the troops in peace, care of the sick, and removal and treatment of the wounded in wartime, as well as for the hygienic welfare of troops, lay-out and inspection of barracks, camps, and billets, and advice on water supply, cooking, rations, and latrines. It is the authority for the rationing and pay of sick and wounded in its charge, and for the disposal of the arms and ammunition carried by the men it receives into casualty clearing stations and hospitals.

Under the terms of the Geneva Convention officers and men of the R.A.M.C. rank as protected personnel.

Royal Army Ordnance Corps.

Corps of the British army responsible for munitions. Formed as a unit in 1881, the corps originated in 1350 as a company of the siege train based at the Tower of London, and was

specially enrolled in wartime. In 1450 the company was superseded by the board of ordnance, which was partly military and partly civilian, the master-general of the ordnance being the head of this body from the time of Henry VIII. The board managed all affairs of artillery and engineers.

Its administration was shown to be defective after the Crimean War, and reorganization resulted in its duties being vested in the minister for War. In 1870 it became a branch of the Army Service Corps as ordnance store companies; these companies were constituted a separate unit, the Ordnance and Store Corps, in 1881. The title was in 1889 changed to Army Ordnance Corps, the prefix Royal being granted in 1918. The badge is a shield bearing three cannon balls in a horizontal row over three cannon one above the other.

The duties of the corps consist in providing, receiving, holding, and issuing munitions of war and military vehicles and material of all descriptions, clothing for camps, and clothing and necessities for use in the field. It is not a manufacturing organization, but receives all stores whether made in government arsenals or by private firms, arranges for their inspection, and holds them until required for issue to any unit. Its vocabulary of stores is a list of all articles in current supply and contains some 350,000 entries.

Until the formation of the Royal Electrical and Mechanical Engineers (*q.v.*) in 1942, the R.A.O.C. shared with the Royal Engineers and the Royal Army Service Corps responsibility for the maintenance and repair of mechanical transport, fighting vehicles, and electrical and mechanical equipment. Originally classed as non-combatants, personnel of the R.A.O.C. are now trained as infantrymen. The corps is directly under the director-general of ordnance and its officers belong to the Army Ordnance Department. The peace strength is 11 companies and one depot company.

Royal Army Pay Corps. Corps of the British army. Established in 1878 as the Army Pay Corps, the corps developed from a department formed in 1868 to establish on a regimental basis the unit

paymasters, one of whom was attached to each regiment. The unit paymasters held military status, replacing the civilian pay clerks who until the early 19th century accompanied troops in the field.

As now constituted, the R.A.P.C. (it received the prefix Royal for services in the First Great War) is responsible for keeping individual accounts of officers and other ranks; providing funds in the appropriate currency for the payment of the army and for army services throughout the world; paying allowances to dependents of soldiers; and compiling cost accounts for all forms of costed establishment.

Most officers of the corps are qualified accountants, while other ranks are recruited by selection from men who have attained a good educational standard and completed their basic military training. Every recruit receives six months' initial training in book-keeping, costing methods, and clerical and accounting duties. The corps is divided between command pay offices and regimental pay offices; the former are concerned with receipts and disbursements relating to military services, while the latter are responsible for the pay accounts of soldiers.

A considerable proportion of the clerical personnel is on attachment from the Women's Royal Army Corps. During active operations, detachments of the R.A.P.C. accompany forces in the field to deal with exchange and banking.

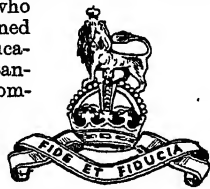
Royal Army Service Corps.

Corps of the British army responsible for supply, transport, and barracks services. Early transport and supply arrangements were improvised by regimental commanders, who employed

and paid civilian contractors. In 1794 a Corps of Waggoners was formed, and in 1799 this was replaced by the Royal Waggon Train, which was disbanded in 1833. For the Crimean



Royal Army Ordnance Corps badge



Royal Army Pay Corps badge



Royal Army Service Corps badge

War a Land Transport Corps was established, which in 1856 became the Military Train, organized as a cavalry regiment. In 1870 an Army Service Corps was formed, but in 1889 this was split into two separate units: the Commissariat and Transport Corps, and the Ordnance and Store Corps. In 1889 the latter became the Army Ordnance Corps, and the former was reorganized as the present Army Service Corps, receiving the prefix Royal for services in the First Great War.

The principal duty of the R.A.S.C. is to provide all road transport for the army. It operates every type of mechanised transport vehicle from motor cycles to tank transporters. Personnel of the corps man the DUKW, wheeled amphibious ship-to-shore vehicles which proved so successful in the Sicily, Italy, and Normandy landings; operate the Buffaloes, tracked amphibians which carry infantry and supporting arms into the assault on defended beaches or across rivers; and supply and maintain airborne troops, as during the Arnhem battle, when the R.A.S.C. loaded supplies on the aircraft in England, flew with them to the dropping zone, and distributed the stores on landing. Besides its normal rôle of goods transport, the corps provides the drivers of ambulances and other R.A.M.C. transport, and the drivers of headquarters staff cars. It has its own workshops for maintenance and immediate repair of vehicles.

For coastwise distribution of military supplies, the R.A.S.C. mans a fleet of motor launches, self-propelled barges, and ocean-going steamships of 250 tons. These vessels fly the blue ensign with crossed swords in the fly. R.A.S.C. vessels were the first ships to enter Bizerta after its capture in 1943, and R.A.S.C. launches took part in the Normandy landings.

On the supply side the R.A.S.C. is concerned primarily with the provision of food, so that personnel are trained as butchers, bakers, storemen, and clerks. It operates field butcheries and mobile field bakeries which can produce each 30,000 lb. of bread daily. The corps also maintains and operates petrol supply installations, tankers, and pipe-lines. Barracks services include all domestic requirements, such as housing, heating, lighting, and laundry.

For administrative and operational purposes, the R.A.S.C. is

divided into companies according to their specific function; i.e. troop carrying, water transport, tank transport, bakery, butchery, ammunition, amphibians. The strength of the corps accounts for about 14 p.c. of the army establishment, and all personnel are trained as combat troops, prepared not only to defend themselves, their depots, and vehicles, but also to fight as infantry if occasion demands. In the Second Great War the R.A.S.C. suffered heavier casualties in proportion to strength than any other corps.

Royal Army Veterinary Corps. Corps of the British army responsible for the provision, training, and issue of animals required by any branch of the service, and for the treatment of sick and wounded animals, and for their care and maintenance in health. Until the end of the 18th century,



Royal Army Veterinary Corps badge

the army veterinary service consisted of farriers attached to each cavalry squadron, each of whom carried an axe with which to dispatch horses wounded beyond recovery. In 1796 veterinary surgeons were attached to cavalry regiments, and in 1856 a department was formed to include all regimental veterinary officers. In 1903 the corps was placed on a regimental basis as the Army Veterinary Corps, receiving the prefix Royal in 1919.

Mechanisation has greatly reduced the use of animals in warfare, but animal transport remains in some countries an essential part of army supply systems. In the Second Great War, the R.A.V.C. was responsible for thousands of pack mules employed in Italy and Burma. It trained and kept in health all dogs used by the army for guard duties and mine detection. In peace the R.A.V.C. breeds livestock for units overseas; provides meat inspectors at military stations; and carries out research in the prevention and cure of animal diseases communicable to man.

Royal Artillery. Regiment of the British army responsible for manning all guns moving on wheels or tracks, and on static sites. Until the regiment was established in 1716, guns in the

British army were served by civilians, but in 1682 the gunners were brought under the ordnance department for pay and discipline, while the drivers remained civilians and, with their horses, were employed only for the duration of a



campaign. It was unsatisfactory serving of the guns in the operations against the Old Pretender in 1715 that led to the formation of the Royal Artillery, two companies being established on a regimental basis and the gunners enlisted into the ordnance department. The War office then had no control over the artillery, and officers did not purchase commissions, but were gazetted only after graduating from the academy at Woolwich.

In 1727 the regiment was given its present title of Royal Regiment of Artillery. In 1790 its drivers ceased to be civilians and were enlisted into the regiment. The regiment was divided into Royal Horse, Royal Field, and Royal Garrison Artillery in 1793. After the Napoleonic wars it passed under the control of the War office, and in 1925 the field and garrison branches were amalgamated. As units have served in every British campaign, there is justification for the regimental motto, Ubique (Lat. Everywhere).

Until the Second Great War, the R.A. was organized in brigades, the brigades in batteries, and these in sections. The brigade has now been replaced by the regiment and the section by the troop. The main regiments of artillery are: field regiments, whose 25-pdr. gun either have tractors or are self-propelled, to provide close support fire for infantry or armour in attack or defence; anti-tank, to deal with enemy armour; medium and heavy, armed with howitzers and long-range guns; heavy and light A.A.; rocket-firing; coast defence; searchlight; and ranging and survey. The R.A. is now completely mechanised. In the Second Great War its personnel comprised 25 p.c. of the British army's total strength.

Royal Assent. Particulars of the way in which the king's assent is given to a parliamentary Act will be found under Assent, Royal.

Royal Australian Air Force. Body formed at Point Cook, Victoria, in 1911 as the Australian Flying Corps. The R.A.A.F. is the senior dominion air force. In 1915

it sent a fighter squadron to serve with the British forces in Mesopotamia. By 1918 the R.A.A.F., having received the prefix Royal in 1917, possessed one squadron in Palestine, three in France, and a training wing in Great Britain. Between the wars considerable expansion took place, and in 1937 the R.A.A.F. became largely responsible for the air defence of Singapore. Shortly after the outbreak of the Second Great War it moved a flying-boat squadron and a fighter squadron to the U.K., while continuing to maintain the defence of Australia and British New Guinea. Heavy losses were suffered in the Japanese invasions in the Far East, but the R.A.A.F. was quickly reorganized and had a prominent part in the island-hopping campaign that preceded the Japanese surrender. Uniform is similar to that of the R.A.F., but is a darker blue, and officers wear miniature wings on the sleeve above the rank rings. In 1947 the establishment was fixed at 15,000 officers and men, and consists of three types of squadrons: long-range heavy bomber, fighter, and transport. See Australia in the Second Great War, p. 795.

Royal Australian Navy. Established in 1909 to replace the Royal Navy squadron which had been stationed in Australian waters since the first settlement of the country and the cost of which, since 1887, had been shared by the British and Australian govts. In 1914 the Royal Australian Navy possessed one battle cruiser, five cruisers, twelve destroyers, six submarines, and four sloops. During the First Great War, its ships served in the North Sea, Mediterranean, Dardanelles, and Pacific. After the Washington naval treaty of 1922, the fleet was reduced to two cruisers and a few destroyers and submarines. In 1928 two cruisers, two submarines, and a seaplane carrier were added.

At the outbreak of the Second Great War, the R.A.N. comprised six cruisers, 12 destroyers, a seaplane carrier, three submarines, and four sloops. Ships served in all theatres of the war and suffered heavy losses. Australian bases provisioned and maintained the British Pacific fleet in the war against Japan. (See Australia in the Second Great War, p. 795.) In 1947 the R.A.N. had four cruisers, eight destroyers, nine frigates, six submarines, and auxiliary craft. Personnel numbered 13,500 officers and men, nearly all Australian. The R.A.N. is administered by a

naval board under the federal minister of Defence. Training and organization are on the same lines as those of the Royal Navy, and in wartime the R.A.N. becomes an integral part of the latter although it may not be used outside Australian waters without concurrence of the Commonwealth govt.

Royal Automobile Club. Recognized authority and governing body of motoring in the U.K.



Royal Automobile Club badge

Founded in 1897, it became known in 1907 as the Royal Automobile Club of Great Britain and Ireland. The headquarters is 89-91, Pall Mall, London, S.W.1. Its estimated total membership is 300,000. In Paris there is the Automobile Club of France, the h.q. of motoring and motor racing.

Royal Auxiliary Air Force. British flying unit, established in 1924 as the Auxiliary Air Force. Its squadrons are in peace time recruited through the county Territorial Army and Air Force associations. Recruits are drawn from the district in which squadron headquarters is situated, and training is carried out after working hours on week days and during week-ends. Squadrons have annually a fortnight's intensive training in camp. Officers serve for a minimum period of five years followed by five years in the reserve; other ranks for four years on the active list and four in the reserve. The force has flying and barrage balloon squadrons. Its insignia is a white metal A worn on the lapels of officer's tunics and a worsted A on the sleeve of the tunics of other ranks.

At the outbreak of the Second Great War, when the Auxiliary Air Force was merged into the R.A.F., the force had 20 flying squadrons and 44 balloon squadrons. On Oct. 16, 1939, an A.A.F. Spitfire pilot brought down the first German bomber to fall in Great Britain. In 1947 the A.A.F. was re-formed on pre-war basis, and granted the prefix Royal in 1948.

Royal Bounty. Sum of money from which the British sovereign makes official donations and subscriptions to charities. It forms an item of the civil list and was fixed at an annual amount of £13,200 in 1837, since when it has remained unaltered. The king's bounty, a monetary grant made by the sovereign to those of his subjects whose wives are delivered of three

or more children at a birth, is paid from the royal bounty.

Royal Canadian Air Force. Established in 1924 from a nucleus of squadrons which had flown in the First Great War, the R.C.A.F. was under army control until 1938, when it became an independent service. At the outbreak of the Second Great War, the force had a mobilised strength of 3,500 officers and men, and immediately sent to Great Britain two army cooperation squadrons, one of which was converted to fighters early in 1940, taking part in the battle of Britain. During the war the R.C.A.F. underwent rapid expansion, eventually having 45 operational squadrons serving in various theatres. Squadrons based in Canada provided air cover for Atlantic convoys, and Canadian training schools provided large numbers of airmen under the Empire Air Training Scheme (g.v.). In 1947 the R.C.A.F. had an establishment of 30,600 officers and men organized into five commands, administered by the Canadian department of defence. See Canada at War, p. 1704.

Royal Canadian Navy. Established in 1911, this force was formed from two over-age cruisers which had been purchased in 1910 and stationed at Halifax and Esquimalt, two bases taken over from the R.N. At the outbreak of the First Great War the R.C.N. consisted of two cruisers and two destroyers which served on Atlantic patrol. Large flotillas of auxiliary vessels were mobilised, performing all convoy protection in Canadian waters. In 1922 the R.C.N. passed under the control of the Canadian department of defence, but there was little expansion, and in 1939 the force had only five destroyers and a few minesweepers, personnel totalling 1,972 officers and men.

During the Second Great War, the R.C.N. increased to a total of 373 vessels of all types up to cruiser category and provided Atlantic escorts and patrols. In 1947 its strength was fixed at 10,000 officers and men, and the establishment comprised one aircraft carrier, two 8,000-ton cruisers, eleven destroyers, 18 frigates, and eleven minesweepers. The R.C.N. cannot serve in wartime outside dominion waters without sanction of the Canadian govt. See Canada at War, p. 1704.

Royal Corps of Signals. Corps of the British army responsible for providing and maintaining telephone, telegraph, and radio communication. Signalling in the British army was on a regimental

basis and by flag and heliograph until 1872, when a telegraph battalion of the Royal Engineers was formed; this served in the Egyptian campaign of 1885. After the S. African War, R.E. wireless companies were established, and in 1912 the telegraph and wireless companies were re-formed as signal companies. In 1920 the signal sections were organized as the present Royal Corps of Signals.



Royal Corps of Signals badge

Its duties extend from the War office to theatres overseas and thence to battalion headquarters, at which point responsibility for communications is taken over by each unit's regimental signallers. The corps also provides land signal communication for the R.N. and R.A.F. in operations outside Great Britain. It carries out field maintenance of all signal equipment used by itself or other arms; trains regimental signalling instructors; enciphers and deciphers messages; and in action furnishes signal sections for assault troops in combined operations.

Royal Electrical and Mechanical Engineers. Corps of the British army responsible for maintenance and repair of fighting vehicles and electrical and mechanical equipment. Established in 1942, the corps was formed from personnel of the Royal Engineers, Royal Army Service Corps, and Royal Army Ordnance Corps who had specialised in technical work on armoured vehicles, fire control equipment, radiolocation, telecommunication, and A.A. equipment. Tank recovery companies, operating with the forward troops, salvaged and repaired fighting vehicles on many battlefields of the Second Great War. Privates in the corps are given the title of craftsmen, and all personnel are trained as combatant troops, as well as in their appropriate trades. Craftsmen are of three classes according to their trade proficiency. The R.E.M.E. administrative unit is the field or base workshop.



Royal Electrical and Mechanical Engineers badge

Royal Empire Society. Body founded as the Royal Colonial Institute in 1868. The name was

changed at the diamond jubilee in 1928. Its objects are to promote the preservation of a permanent union between the mother country and all parts of the British Empire; and to maintain the power and best traditions of the Empire. King George VI and Queen Elizabeth are patrons and the duke of Gloucester is president. Spacious headquarters in Northumberland Avenue, W.C.2, include a magnificent library and an information bureau. Weekly talks are given by distinguished authorities in the Empire. Membership, 24,000.

Royal Engineers. Corps of the British army. Established in 1856, it is responsible for the army's constructional work, bridging, mine clearing, for manning assault vehicles, surveying and making maps, and other technical duties.



Royal Engineers badge

In 1300 a chief engineer was appointed to maintain the army's engines of war stored at the Tower of London, but there were no specific companies of engineers or artificers to serve with troops in the field. The Plantagenet kings employed gangs of Cornish miners when there was a town to be invested or troops to be entrenched; in later reigns Yorkshire colliers were engaged and paid by contract. In general, however, such military engineering tasks as building bridges and causeways were undertaken by the infantry. In 1345, Henry of Lancaster enlisted artisans into military engineering companies to construct tunnels in the campaigns in France, but the companies were later disbanded.

About the middle of the 15th century an ordnance department was created to develop the army's artillery branch, and companies of artisans called sappers were attached for the purpose of building emplacements and other fire positions for the guns. Sappers eventually became wholly responsible for manning the guns, and so continued until 1716, when the Royal Artillery was established. Next year the creation of a corps of engineers was ordered, but commissions were not granted until 1757, and the corps continued part of the artillery establishment.

During the siege of Gibraltar (1779-83), Sir William Green, chief army engineer with the garrison, enlisted a company of military artificers to construct galleries

and repair defences. In 1788 similar companies were raised in Great Britain; the officers commanding them became the Corps of Royal Engineers. The men were regimented as the Royal Military Artificers, renamed the Corps of Royal Sappers and Miners in 1813; and in 1856 united with the Corps of Royal Engineers.

Every major campaign has brought new duties to the R.E. In the First Great War they manned searchlights and had special companies for the investigation of gas warfare. Other tasks included camouflage, meteorology, and providing personnel for the army post office. Throughout the Second Great War, the work was increasingly onerous. Royal Engineers went with the forward troops in all operations, and when the armies were advancing they cleared minefields. Bridging companies spanned such rivers as the Chindwin and Rhine. Until the R.A.F. enlisted its own constructional units, the R.E. built hundreds of airfields at home and overseas. They were the first troops ashore when the Allies invaded Normandy on June 6, 1944, landing as an assault brigade equipped with modified Churchill tanks. These vehicles were armed with a petard for throwing explosives through pillbox loopholes, and carried a bridge for crossing anti-tank ditches. Equipped with Buffaloes, the assault brigade carried the infantry to the attack on S. Beveland, and later transported commandos across the Rhine.

Personnel of the R.E. are mostly skilled tradesmen, but they receive a basic infantry training and form a reserve of fighting troops to be used in emergency. In wartime the corps does not take the field as a unit, but as companies attached to divisions to organize bridge and road building, constructional work, and minelaying and clearing. The R.E. have also founded separate units, e.g. the Royal Flying Corps (g.v.), and the Royal Corps of Signals, established in 1920 from the signal section.

Royal Exchange. London building for merchants and bankers. It is between the Bank of England and Cornhill, E.C. The third on the same site, it was built from designs by Sir William Tite. The prince consort laid the foundation stone, Jan. 17, 1842, and Queen Victoria opened the building, Oct. 28, 1844. A flight of steps, from which a new sovereign is proclaimed on accession, leads to the Corinthian portico, 96 ft. wide,



Royal Exchange, London. The fine Corinthian-style portico of the exchange, near the Bank of England

74 ft. high, and with eight columns 41 ft. in height. In the centre of the sculptures of the tympanum, by Westmacott, is a crowned figure of commerce holding the charter of the Exchange, with a lord mayor and other civic dignitaries on one hand and representatives of foreign nations on the other. Dean Milman selected the text, Ps. 24, v. 1, on the architrave. An inscription, in Latin, along the frieze, commemorates the foundation. At the E. end is a campanile, 180 ft., with statue by Behnes of Sir Thomas Gresham and a vane reproducing his crest, a gilded grasshopper, preserved from the first Royal Exchange. The vane was temporarily removed during the Second Great War.

There are many statues, including those of Victoria, by Thornycroft; Elizabeth, by Watson; Charles II, by Gibbons; and Wellington, Chantrey's last work, cast from captured cannon. The memorial to Londoners who fell in the First Great War was designed by Sir Aston Webb, the sculptures being by Alfred Drury and the carving and lettering by W. S. Frith. On the walls of the ambulatory of the interior colonnaded quadrangle are more than 30 spirit varnish frescoes, depicting the history, especially the commercial history, of London. Among the artists whose work is represented here are Leighton, Edwin Abbey, Sir Frank Brangwyn, Frank O. Salisbury, and Stanhope Forbes. The rooms at the W. end are devoted to the Royal Exchange Assurance Association.

The first exchange in London was erected by Sir Thomas Gresham in 1566-67, and named and opened by Elizabeth, Jan. 23, 1571. Destroyed in the Great Fire, 1666, it was rebuilt, 1669, by Jarman; but of the second structure all but the clock tower was burnt

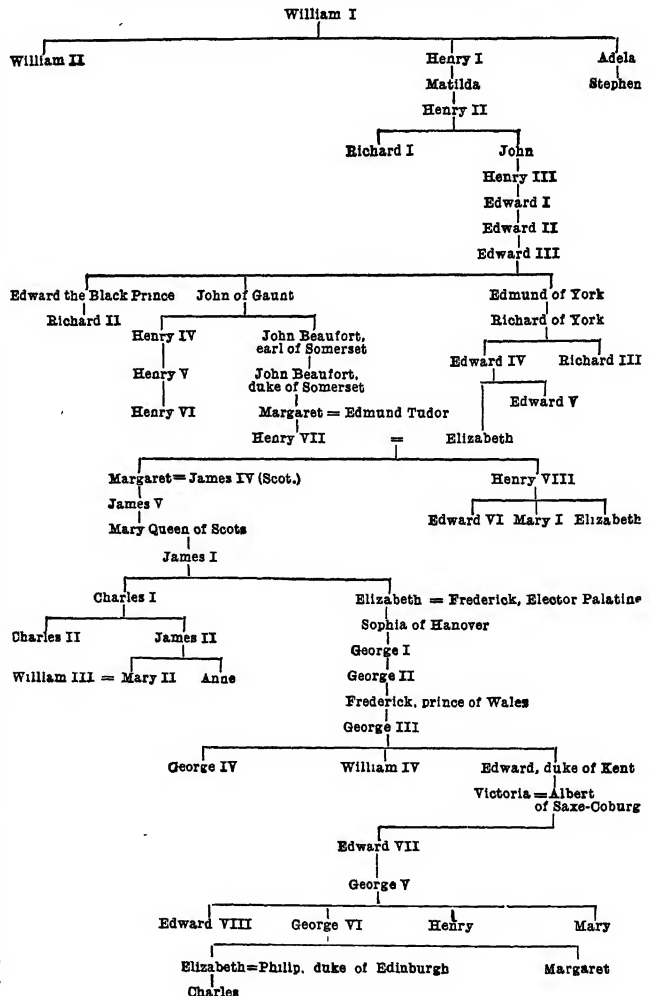
on the night of Jan. 10, 1838. The tessellated pavement of Turkey stone in the interior is a survival from Gresham's day. See *Exchange*; Gresham, Sir Thomas.

Royal Family. Term used in Great Britain for the sovereign and the members of his family, including uncles, aunts, and cousins. It is used in other countries ruled by kings; in those ruled by emperors, imperial family

was substituted. Since 1917 the name of the British royal family has been Windsor, taken by royal proclamation. Queen Victoria belonged to the family of Guelph and her husband Albert to that of Wettin, but these names were not used save by genealogists. As commonly used, the term royal family includes only those near relatives of the sovereign who have retained their British nationality. Thus the last German emperor, although a grandson of Victoria, was not a member of the British royal family.

Members of the royal family enjoy precedence on state occasions and certain social and other advantages, but have also some disabilities, for instance under the Royal Marriages Acts.

GENEALOGICAL TABLE OF THE BRITISH ROYAL FAMILY



The royal family traces back its descent to William the Conqueror, and through Matilda, the wife of Henry I, to Anglo-Saxon kings who preceded him. The line of the Norman kings was continued, through the intervention of a female, Matilda, daughter of Henry I, through the Plantagenet sovereigns, of which house both York and Lancaster were branches, until this ended with Richard III. The house of Tudor was descended, again in a female line, from John of Gaunt, a son of Edward III. A daughter of Henry VII and his wife Elizabeth, a Yorkist princess, married James IV of Scotland, and from that union sprang James V of Scotland and his grandson James VI of Scotland and I of England. The Scottish kings were also descended from Edward III because one of the Beauforts, descendants of John of Gaunt, had married James I of Scotland. Elizabeth, a daughter of James I of England, married the Elector Palatine, and their daughter Sophia was the mother of George I. His descendants included the succeeding Georges, William IV, and the duke of Kent, the father of Victoria. See Civil List; Edward VII; George V; George VI; Stewart; Tudor; Victoria, etc.

Royal Fern OR **FLOWERING FERN** (*Osmunda regalis*). Large, handsome fern of the family Osmundaceae. A native of Europe, Asia, Africa, and America, it has a large rootstock, branching off into several heads. The fronds are of leathery consistency, 10 or 12 ft. in length and about 3 ft. broad, broken into large, paired leaflets, which are again divided into many pairs of oblong leaflets. At the upper part of the fertile fronds these leaflets are more or less contracted and concealed by the confluent clusters of spore-cases, which have the appearance of red-brown flowers. This plant lives in bogs and damp woods.

Royal Flying Corps. Former unit of the British army. Established in 1912, it developed from the balloon companies of the Royal Engineers created in 1880 to operate army observation balloons. The companies later manned the first military aircraft and airships until the R.F.C. was set up. R.F.C. aircrew were at first officers of cavalry and infantry regiments who had learned to fly at their own expense, but soon flying schools were organized to train officers, who were commissioned direct into the corps. There was a naval wing, which in 1914 became the

Royal Naval Air Service. At the outbreak of the First Great War, the R.F.C. had an establishment of 2,000 officers and men and 82 aircraft; most of these last were totally unfit for military purposes. In 1915 the corps was greatly expanded and equipped with efficient machines. In 1918 it was re-organized as the Royal Air Force (*q.v.*), when officers had the option of transferring to the new force or retaining their army commissions.

Royal Free Hospital. Group of London hospitals. The one which gives its name to the group



Royal Free Hospital, London. The buildings and main entrance in Gray's Inn Road

was established in Greville Street, Hatton Garden, 1828, and moved to its present site in Gray's Inn Road, 1842. At later dates the Sussex wing and the Victoria wing were added, and the older buildings rebuilt and enlarged. One wing was destroyed by German bombs in the Second Great War. The Royal Free Hospital, built for the sick poor, is largely staffed by women, and is associated with a school of medicine for women, students of which can take the complete course of study necessary for obtaining the medical qualification. Many scholarships and prizes are offered annually. Other hospitals in the group are the Hampstead General, Hampstead Children's, North-Western, London Fever, Elizabeth Garrett Anderson.

Royal Fusiliers. Regiment of the British army. Raised for James II in 1685 by Lord Dartmouth, master-gen. of ordnance, the regiment was enlisted from Londoners. Its duty was to garrison the Tower of London and provide escorts for the ordnance or artillery, a circumstance that led to its being called the Ordnance

Regiment. In 1687 it was re-armed with fusils and designated the 7th (Royal Fusilier) Regiment of Foot. It saw its first active service with William III in Flanders and won its first battle honour at Namur. It was one of the

regiments that suppressed the Jacobite rising, 1715. In 1718 the regt. was shipped to sea and served as marines at Messina and Copenhagen.

Ten honours were gained in the Peninsular War, where the regiment captured the heights of Albuera; and in the Crimean War it was in the charge at Alma, adding three more honours. It was in the Afghanistan campaign of 1879-80. In 1881 the regiment was retitled The Royal Fusiliers (City of London Regiment). In the South African War it was at the relief of Ladysmith, and in 1904 took part in the expedition which marched to Tibet and into the forbidden city of Lhasa.

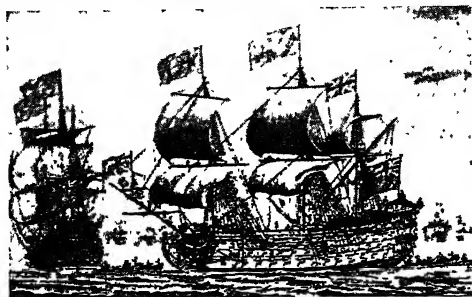
Forty-seven battalions were raised by the Royal Fusiliers in the First Great War, in which the regiment gained the honours: Mons; Marne, 1914; Ypres, 1914, '15, '17, '18; Somme, 1916, '18; Arras, 1917, '18; Cambrai, 1917, '18; Hindenburg Line; Struma; Landing at Helles; Palestine. Two Jewish battalions, the 38th and 39th, were specially raised for the Palestine campaign. In the Second Great War, battalions served in France, 1940; E. Africa; Syria; N. Africa; Italy; Burma; and the liberation of Europe.

For many years after its formation, the regiment's lowest commissioned rank was full lieutenant; its junior officers were gazetted from other units as lieutenants, hence its nickname, The Elegant Extracts. This is one of four regiments privileged to march through the City of London with bayonets fixed, colours flying, and drums beating. See Fusil.

Royal George. British man-of-war. She capsized and sank at Spithead, Aug. 29, 1782. Rear-Admiral Kempenfelt (*q.v.*) and



Royal Fusiliers. Badge of the regiment



Royal George. Man-of-war, which capsized with Kempenfelt and about 800 souls aboard, Aug. 29, 1782
From a print

about 800 officers, men, and visitors perished. Cowper's poem, beginning Toll for the brave, commemorates the disaster. A later Royal George was a yacht, built for George IV. Victoria used it occasionally during the earlier years of her reign, but for many years the vessel lay in Portsmouth Harbour as a hulk before being broken up. Part of her fittings are preserved at Virginia Water.

Royal Horse Artillery. Branch of the Royal Artillery. It was formed in 1793 to provide highly mobile batteries to operate with cavalry, the gunners being mounted on horseback instead of riding on the gun limbers, then the usual practice. Shortly before the Second Great War the R.H.A. was mechanised except for one battery, which remained horsed for ceremonial duties.

Royal Household. Term applied to attendants of the sovereign. The existing system of government in monarchical countries, and even to some extent in those which are no longer so, has developed largely from the sovereign's household, and today in the British kingdom there is a connexion between the government of the day and the royal household. For instance, the lord chamberlain, the lord steward, and other officials are party politicians who leave office with the government. One reason for the persistence of this connexion is the obvious desire of ministers to prevent the sovereign from being surrounded by influence hostile to themselves. Many countries had little administration save that controlled by the king's household. Thus the marshal, the constable, the chancellor, and the treasurer evolved from being merely members of the royal household to important personages in government.

In the U.K. today the king's household is a large one, divided into several departments. Under

the lord chamberlain are the seven lords in waiting, the seven grooms in waiting, and the gentlemen at arms, and many others. Other high officials are the lord steward and the master of the horse. There is an ecclesiastical household, called the college of chaplains, and a medical house-

hold. The master of the household and the crown equerry have each a department. For more personal matters there is the department of the treasurer and the private secretary's office. There is a ceremonial department under a comptroller. The king has also a separate household in Scotland, mainly of honorary officials.

Other members of the royal family have households. Those of the queen and the queen mother are under a lord chamberlain, and include a mistress of the robes and ladies of the bedchamber. Other royal households are under comptrollers. *See King.*

Royal Institution. British institution founded in London, 1799, for the encouragement of research and "the application of science to the common purposes of life." The house, No. 21, Albemarle Street, W., still in the occupation of the institution, was purchased 1799, and refronted 1838. Incorporation by royal charter was granted in 1800, and a modified constitution was effected ten years later by Act of parliament. The institution possesses a laboratory, established 1800, and modernised 1872; a library started 1803; and a museum containing the apparatus used by Rumford, Davy, Faraday, Tyn-dall, Dewar, and others. There are four professorships—of natural philosophy, chemistry, physiology, and astronomy. The Davy-Faraday research laboratory was established and endowed by Ludwig Mond in 1894.

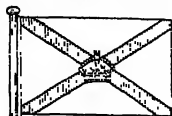
Royal Insurance Co., Ltd. A British insurance company. Founded in 1845, it transacts all kinds of insurance business, life, fire, accident, marine, etc. Its head office is 1, North John St., Liver-

pool, and its London office 24-28, Lombard St., E.C. It is represented in some 100 countries. The company has an annual income of over £32,000,000, and its total funds amount to £68,000,000.

Royal Mail Lines. British steamship line. Chartered in 1839 as the Royal Mail Steam Packet Company, two years later it obtained the mail contract for the West Indies, and a fortnightly service of paddle steamers was instituted from Falmouth. In 1851 the service was extended to S. American ports. During the Crimean War the company's vessels were used as transports. Extensions were made to Morocco, the Canary Islands, and Madeira, and in 1910 the company purchased the Pacific Steam Navigation Co. Other lines were absorbed and the company now has a fleet operating to most parts of the world. The offices are in Leadenhall Street, E.C.3.

Royal Marines. Soldiers raised and trained by the R.N. for service with the fleet or in amphibious operations. In the fleets of the 17th century detachments of soldiers were embarked to provide a trained and disciplined nucleus at a time when crews were often forced into service by press-gangs. The first regiment to be raised specifically for sea service was the Duke of York and Albany's Maritime Regiment of Foot, otherwise known as the Admiral's Regiment, which was authorised by an order in council of Oct. 26, 1664. The regt. was recruited from the trained bands of the City of London, whose nickname of "Jollies" has persisted, and from whom is derived the privilege still exercised by the Royal Marines of marching through the City with drums beating, bayonets fixed, and colours flying.

Regiments of marines were raised and disbanded as required throughout the following century, and an independent tradition was firmly established with the capture of Gibraltar in 1704 and then with its subsequent six months' defence by six



Royal Mail Steam Packet flag, white with red cross



Royal Institution arms



Royal Marines cap badge

battalions of marines. From Gibraltar dates the conception of a military force, serving as an integral part of the fleet at sea and trained to undertake land operations to further naval strategy.

Throughout the naval wars of that century, in particular the Seven Years War, marine detachments played a leading part in innumerable small raids on enemy coasts. The corps acquired, in 1755, a permanent organization of three divs.

During the blockade of Brest the marines distinguished themselves in the assault on Belle Isle in 1761, for which they were granted the badge of the laurel wreath, still worn. During the wars with France, 1793-1815, the strategy of small coastal raids was continued, and the marine corps grew in strength to 31,000 men. As a consequence of the marines' excellent conduct during the naval mutinies at Spithead and the Nore, in 1802 the king authorised the corps to bear the title royal.

In 1827 George IV granted the Royal Marines the badge of the globe as the symbol of their world-wide service, to be worn with their earlier distinction of the laurel, the *Per Mare, per Terram* motto, and the battle honour Gibraltar, which completed the Royal Marine crest.

Royal Marine Artillery

In 1804, at Nelson's request, Royal Marine artillerymen were raised, originally for the purpose of manning the armament of the bomb ketches with which the navy bombarded enemy coast defences. A company of these Royal Marine artillerymen was maintained at each div. as a separate arm of the corps. They were the "blue" marines, the infantry being "red" marines. Before the institution of the naval gunnery school at H.M.S. Excellent, the R.M. artillery was the only branch of the naval service systematically trained in gunnery, and in 1862 became a separate corps, the infantry becoming the R.M.L.I. a title earned during the Crimean War.

With the introduction of regular service into the R.N. in 1857, the original function of the marines disappeared, but the intense *esprit de corps* and tradition of discipline of the marine detachments provided in a battleship a spirit that was of value. By 1914 the marines manned one turret of the main armament of a battleship and a portion of the subsidiary armament besides forming a trained landing force. The development of weapons such as the mine and

the torpedo, and the increasing strength of coastal defences limited their opportunity for small scale raids, a limit further accentuated by their gunnery responsibilities.

In the First Great War the corps was expanded to nearly 57,000 by 1918. Its primary task remained service with the fleet, and marines took part in every major naval action, 5,832 being present at Jutland where they suffered 589 casualties and won a V.C. An R.M.L.I. bde. was formed and took part in the operations at Antwerp, in the Gallipoli landings, and on the Western front. At Gallipoli more than a thousand marines were engaged in the first naval attempt to force the strait, while in the attack on the pen. the Plymouth battalion was the first to attempt a landing and the last to leave during the evacuation.

In this fighting the R.M. bde. formed part of the Royal Naval div., commanded by a Royal Marine, Gen. A. Paris. This div. moved to the Western front in 1916, taking part in the fighting on the Ancre, in particular the attack at Beaumont Hamel. Here the 1st R.M.L.I. went into action 400 strong and only 138 returned. The bde. continued in France until the armistice, and since it was thus already committed the landing force at Zeebrugge was drawn from the fleet; this was the "immortal fourth" battalion, which stormed the mole on St. George's day, 1918, with such gallantry that King George V, as col.-in-chief of the corps, ruled that no other battalion should bear that number; two V.C.s were won by marines on this occasion.

The Royal Marine Artillery formed howitzer and A.A. batteries for service in France, and also the trained nucleus for the heavy batteries that served in the campaigns in S.W. and E. Africa. The marines laid submarine mines, manned the armament of defensively equipped merchant ships, and provided labour battalions on supply ships maintaining the army in France. A marine officer was one of the first four pilots trained in 1911 for the Royal Naval Air Service, in which marines served throughout the war. The Royal marine bandmen in action manned the fire control apparatus directing the fire of the main armament.

By 1923 the R.M.A. and R.M.L.I. had been amalgamated to form one corps again, 9,000 strong. As a result of the Gallipoli failure, it came to be considered that amphibious attack on a coast-

line defended by minefields and modern batteries was impossible, and the *per terram* activities of the marines were narrowly restricted. Indeed, they often did longer time at sea than sailors. A nucleus formation called the mobile naval base defence organization, consisting of A.A. and coastal defence batteries, signallers, searchlights, a landing and maintenance unit, and a land defence force was, however, maintained, the purpose of which was to establish and temporarily defend a shore base for the fleet.

Mobile Naval Base Defence

In 1939 this nucleus was almost the only force left for shore service so that, when it was decided once more to form a Royal Marine bde. for amphibious operations, few regulars could be spared for it. When the campaign in Norway demanded landing operations, sea-service marines made the first landings at Namsos and Aandalsnes. The first trained battalion of the bde. was ready to carry out the occupation of Iceland.

The mobile naval base defence organization (M.N.B.D.O.), after its A.A. gunners had distinguished themselves in the battle of Britain (one battery shooting down 44 German aircraft in 40 days), sailed for Crete to establish a fleet anchorage at Suda Bay. Before the whole formation reached the island the German airborne invasion forced the marines from their positions to fight in the rearguard which covered the retreat to Sphakia and the consequent evacuation. The formation later did valuable work in the Middle and Far East, and a second M.N.B.D.O. took part in the invasion of Sicily.

The Royal Marine bde. began to expand during 1940 into a Royal Marine div., the first two bdes. of which stood by during the period when German invasion of the British Isles threatened. In the autumn they sailed for W. Africa on the abortive Dakar expedition. After Dunkirk, however, combined operations became the principal field of Allied war effort. By 1943, the R.M. div., instead of being a specialised body, was duplicating the function of several army divs. which had been trained for amphibious operations. For this reason the R.M. div. was broken up into six Royal Marine Commandos—two already existed, and had been in action at Dieppe, in Sicily, at Salerno, and Termoli. The remainder of the divisional troops were then trained to man assault landing craft, and to provide guns' crews for special craft

which supported landing operations from close inshore—an interesting revival of the original function of the R.M.A. The M.N.B.D.O.s were also disbanded and their personnel was used to form another commando and to carry out various landing craft tasks. In these rôles the Royal Marines took part in the invasions of Normandy and Burma, operations of the Italian campaign, the amphibious guerrilla warfare in the Dalmatian islands, and the assault on the Westkapelle dyke in Walcheren.

Marines were again engaged in every major naval action. Their A.A. batteries formed part of the defence against the flying bomb attacks on London and Antwerp. Marines manned the heavy cross-Channel naval guns near Dover, and Royal Marine Engineers were employed in every theatre, rehabilitating captured ports and carrying out essential engineering work at remote naval bases. Numbers grew from 10,000 in 1939 to 78,000 (including R.M.E.s and bands) in 1945.

The provision of commandos, of crews for assault landing craft, and gunners for support craft, in addition to service with the fleet, were made regular functions of the corps, normal peacetime enlistment in which is for 12 years with the option of re-engagement for a further nine. Ranks and titles are the same as in the army, but marines may qualify for specialist naval ratings.

Training for recruits covers all branches of infantry work, naval gunnery, and seamanship. The senior squad of recruits under training is known as the king's squad, and the best recruit is awarded the king's badge, inaugurated by King George V in 1918. The king's badge is worn by the man who earns it throughout his service, no matter what rank he may attain. The uniform is blue, with a red stripe on the trousers, the headgear a forage cap of blue with a red band or a beret with a red flash. Royal Marine Commandos wear khaki battledress with the Royal Marine beret. The distinctive feature of the full dress uniform is the white pith helmet surmounted by a gold spike, which is worn by the divisional bands, who also retain the broad red trouser stripe of the old Royal Marine artillery.

Wilfrid Sendall

Royal Marriage Act. Law passed by the British parliament in 1772 with the object of preventing members of the royal family

from marrying without the king's consent. The measure was demanded by George III, because his brothers, the dukes of Cumberland and Gloucester, had contracted secret marriages with ladies of comparatively humble birth. It forbade any descendant of George II, except the issue of princesses married to foreigners, to marry before the age of 25 without the king's assent; if over 25 they could marry by giving notice 12 months beforehand to the privy council, unless parliament decided against the proposed union. The bill was carried into law in spite of much opposition, and is still in force; but by His Majesty's Declaration of Abdication Act, 1936, it does not apply to Edward VIII or his descendants. See Royal Family.

Royal Military Academy. Military college maintained at Sandhurst, Berks, for training cadets before they are commissioned in the army and R.A.F. Regiment. Until 1939 the title was borne by the Royal Artillery and Royal Engineers college at Woolwich. Woolwich was closed at the outbreak of the Second Great War, and in 1946 was amalgamated with the Royal Military College to form the present academy. This trains candidates for commissions in the Household Cavalry, Royal Armoured Corps, Royal Artillery, Royal Engineers, Royal Corps of Signals, brigade of Guards, infantry, R.A.O.C., R.A.S.C., R.E.M.E., and R.A.F. Regiment.

Cadets spend eighteen months at the academy, and there is an intake every six months. Candidates must have served six months in the ranks of a regular regiment or corps and must be between 18½ and 19½, or they may enter direct from school if they are between 17½ and 18½ and have passed an examination similar to the civil service entrance examination. No fees are chargeable and text books are free. Cadets are paid 5s. a day. The academy is divided into three colleges, each accommodating 500 cadets. See Commission; Military Academy; Officer.

Royal Military Police. Details of this body will be found under Military Police, Royal.

Royal Naval Air Service. Former component of the Royal Navy. Originally part of the Royal Flying Corps, it was transferred to the Royal Navy in July, 1914, and made responsible for manning and maintenance of airships and seaplanes operating with the fleet. During the First Great War the

R.N.A.S. provided anti-submarine patrols and carried out raids on enemy bases in Belgium and Germany. In 1918 it was incorporated with the R.A.F. In 1922 the Fleet Air Arm (*q.v.*) was created.

Royal Naval Reserve. Component of the Royal Navy. Established in 1861, it is recruited from officers and men of the merchant navy. Officers may join as midshipmen during their apprenticeship or as sub-lieutenants up to the age of 30. They undergo a year's training aboard a warship and take short courses of instruction at gunnery, torpedo, and signal schools. Ratings are enrolled for a period of five years and may re-engage for a maximum of four further periods each of five years; the last term is for shore and harbour duties only. In both Great Wars, R.N.R. personnel served with the main units of the fleet, but mostly they manned auxiliary vessels, armed merchant cruisers, escort vessels, and minesweepers.

Royal Naval Volunteer Reserve. Component of the Royal Navy. Established in 1903, it was recruited from yachtsmen and other civilians interested in the sea and who received part-time training and were liable to be called up for service with the Royal Navy in the event of war. During the First Great War the R.N.V.R. had a strength of 38,000 officers and men, the majority of whom served in motor torpedo boats and patrol craft. In 1936 the Admiralty instituted the Royal Naval Volunteer Supplementary Reserve to provide a reserve of officers. No qualifications were required from candidates and no provision was made for training in peace, but personnel underwent three months' training on mobilisation. The R.N.V.R. greatly expanded in the Second Great War, when officers and ratings served in every class of ship. All temporary wartime officers were commissioned in it and, to the number of 48,000, formed 80 p.c. of all naval officers serving. They commanded destroyers, submarines, escort vessels, minesweepers, and the majority of coastal craft.

In 1946 the R.N.V.R. was reorganized in five geographical divisions: Ulster, Sussex, London, Forth, and Tay. Members train with the fleet for 14 days annually. Ratings receive an annual bounty of £5. The R.N.V.S.R. was reconstituted, and restricted to officers who held temporary commissions in the war. In 1947 four R.N.V.R. air squadrons were formed.

THE ROYAL NAVY: SENIOR BRITISH SERVICE

GORDON HOLMAN, Author of *The King's Cruisers*, etc.

In conjunction with this general article, readers should refer to Atlantic, Battle of; Coastal Command; Dutch Wars; Fleet Air Arm; Mediterranean Sea; Navy; Submarine, etc., and to entries on sea battles of the First and Second Great Wars and other wars, e.g. Coral Sea; Jutland; Matapan; Plate; Trafalgar.. See also colour plates facing pages 7144-45

Fighting vessels guarded England's shores even before King Alfred's time. Offa, King of Mercia, had a fleet. But it was Alfred who created the first fleet, of long ships—square-sailed vessels, some with as many as 60 oars also. Canute and Harold both maintained fleets; but England's first permanent sea defences were provided by the barons of the Cinque Ports (*q.v.*). Their fishing craft, busses and cogs for the most part, were constantly ready to turn over to the king's service in time of emergency.

Comings and goings between England and Normandy in the early part of the 12th century entailed the use of ships of war. William, son of Henry I, was drowned when the White Ship went down in 1120. Henry II made use of sea power to disperse a fleet off the Flemish coast when faced with rebellion in France and England.

Before 1200, Richard I had carried the fame of English ships and sailors into E. Mediterranean waters. When some English sailors were murdered in Cyprus he deposed the ruler and established a government in the island. Richard himself fell into hostile hands when shipwrecked while returning from the Crusade, and was imprisoned for more than a year. In John's reign French and Flemish vessels were destroyed in the port of Damme by an English fleet commanded by William Longsword, earl of Salisbury; and sailors were among the few who remained loyal to John to the last.

Edward III's Victories

The Hundred Years War broke out in 1338, and in the autumn of that year a French fleet moved along the S. coast of England, burning parts of Southampton and Portsmouth. In 1340, however, Edward III attacked a French fleet which had gathered at Sluys with about 200 ships and gained a notable victory. His successful siege of Calais seven years later was backed by a fleet of more than 700 ships; and in 1350 Edward inflicted heavy losses on a powerful Spanish fleet in the Channel. The English fleet suffered a defeat by the French at La Rochelle in 1372.

During the following centuries English ships were steadily im-

proved as fighting units. They also made voyages of discovery to the west and to the east as the 15th century ran out and the 16th dawned: in 1497, for instance, John Cabot and his son Sebastian sailed from Bristol and reached the N. American mainland. Gunpowder came into regular use in ships, Henry VII introducing 225 small guns, called serpentes, into the four-masted ship *Regent*. Portsmouth and the dockyards at Woolwich and Deptford became the centres from which England's new sea power developed.

Defeat of the Spanish Armada

A glorious chapter opened in 1558 with Elizabeth's ascent of the throne, her "sea-dogs" engaging in stirring exploits that successfully demonstrated English hostility and indifference to the papal gift of the Americas to Spain and Portugal. Philip V of Spain made ready for war with England, his invasion fleet gathering in Cadiz harbour, where Drake visited it, "singeing the king of Spain's beard," by burning his ships and stores.

The Spanish threat led Elizabeth to improve the fighting organization of English shipping, a committee of officers of state, including the lord high admiral, shipwrights, and seamen, meeting in 1583. When news of the approach of the Armada (*q.v.*), which sailed on July 12, 1588, reached England, a wave of national feeling caused every man to muster to the queen's support, and created great enthusiasm for the fleet. In a six-day running fight up Channel the smaller English ships, expertly handled, inflicted heavy damage and casualties on the Spaniards, who reached Calais to find English and Dutch ships blockading the Flemish ports (then forming part of the Spanish domain). English fire ships drove the Spaniards off and they suffered a further defeat off Gravelines. The demoralised Armada fled north, and foul weather completed its dispersal, 53 ships out of more than 130 being all that reached Spain again.

At Elizabeth's death in 1603, the navy was down to 39 men-of-war and 4 galleys. Almost as soon as he came to the throne, James I issued a proclamation recalling all privateering vessels, and all Span-

ish prizes taken within a month of Elizabeth's death were declared illegal. Fresh life came to the navy with the interest shown by Henry, the young prince of Wales. In 1608, construction of the Prince Royal, largest ship in the navy, started at Woolwich. Phineas Pett, master-shipwright, received the support of Prince Henry; but neglect was still common in many ships, dishonest dealings in the service were frequent, and the navy was unable to deal even with the pirates off the English coast.

A commission appointed by James in 1618 to survey the navy and examine abuses in the administration was established in the following year as a permanent body for the government of the navy. It was said at the time that of the 25 ships which formed the first line of naval defence, "few could safely go farther than Plymouth."

The first public appearance of Charles I in 1625 was a visit to the fleet at Blackwall, but this did not herald an improvement in naval administration, which became more and more complex and increasingly corrupt. Some new ships were built, however, including the *Sovereign of the Seas*, first of the three-deckers. Little concern was shown for those who manned the ships and it was said that "foul weather, naked bodies, and empty bellies made the seamen voice the king's service worse than galley slavery." This, and the memory of disastrous expeditions to Ré and Cadiz, no doubt influenced the mariners' decision against Charles in the month before he raised his standard in Nottingham in 1642.

Expansion by Cromwell

Under the Commonwealth, big efforts were made to abolish corruption in the dockyards and naval establishments. The fleet increased rapidly in numbers, and a permanent organization was set up in all departments. Parliament's control of the navy during the Civil war had enabled its forces to sustain the resistance of Gloucester, Plymouth, and Hull, ports in the heart of royalist country.

In 1651, the Navigation Act, designed to curb Dutch maritime development, was passed by the

English parliament. A few months later the first Dutch war began. Even before the formal declaration, Blake and Tromp had clashed; and late in 1652 Blake was defeated off Dungeness. Victory enabled the Dutch to pass a convoy of 400 sail through Dover Strait in safety. Four months later Blake and Monk defeated Tromp off Portland Bill. Seventeen Dutch ships were taken in another English victory, and then, in a battle fought by Monk off Texel, Tromp was killed. In the subsequent peace, the Dutch agreed to recognize the supremacy of England's flag in English seas.

The internal organization of the fleet was strengthened after the Restoration, when James, duke of York, became lord high admiral. Men of wide sea experience directed the affairs of the navy, and Pepys was clerk of the acts.

Second and Third Dutch Wars

During the second Dutch war, which began in 1665, New Amsterdam, later renamed New York, was taken by an English naval force, while de Ruyter, the Dutch admiral, successfully attacked English forts on the coast of Guiana. In June, 1665, the Dutch were severely beaten off Lowestoft. Just a year later, there was a long drawn out and indecisive battle off the N. Foreland. After refitting, the English fleet sailed boldly along the Dutch coast and destroyed 150 ships in Terschelling roads. Peace negotiations broke down, and in 1667 de Ruyter and a Dutch fleet entered the Thames, burned English men-of-war there, and sailed up the Medway to Rochester. The third Dutch war (1672-74) was marked by a fierce naval battle off Southwold, where, despite the fact that the English had the aid of the French, de Ruyter was again victorious.

Towards the end of the 17th century, the English navy numbered upwards of 170 ships, including 9 first-rates, 11 second-rates, and 39 third-rates; but the battle of Beachy Head, fought on June 30, 1690, saw the French gain supremacy in the Channel. Afterwards, the French planned a large-scale invasion of England, but when they were ready, the English fleet, under Russell, inflicted a crushing defeat on Tourville in the battle of Barfleur and at La Hogue.

The navy, with Dutch assistance, captured Gibraltar in 1704. The war of Jenkins's Ear (*q.v.*) opened in 1739. British naval

forces were employed against Porto Bello and Cartagena, and a great seaman, Anson (*q.v.*), sent to attack Spanish territories in the Pacific, sailed round the world, returning after four years with many Spanish prizes and much treasure. As first lord of the Admiralty from 1751, he chose for high appointment such men as Hawke, Boscawen, Rodney, Howe, and Keppel.

Victory of Quiberon Bay

When the Seven Years' War (*q.v.*) began the press gangs were sent out to get the men needed to man British ships. It was a far-reaching war with sea action spreading from the Channel to the N. American coast and from the Mediterranean to India. In 1759 a French fleet at Lagos was defeated by Boscawen, and Hawke's Quiberon bay triumph was the decisive action of the war. Pocock's success at the expense of d'Ache, in an action off the Coromandel coast, hastened the decay of French power in India; and in Canada the French were unable to get assistance through to Montcalm at Quebec.

When the American colonists rose against British rule, Lord Cornwallis, leading his forces along the coast towards New York, was in 1781 surrounded at Yorktown. With his back to the sea, he looked for relief by an English squadron. Instead, a French fleet appeared, and Cornwallis was forced to surrender. Almost at the same time, British possessions in the W. Indies were threatened by the French, Gibraltar was besieged and Minorca captured by the Spaniards. Admiral Rodney defeated de Grasse near Dominica, and saved Jamaica, Howe relieved Gibraltar, and the U.K. emerged from the struggle with a navy brought to a high state of efficiency.

"The Glorious First of June"

The French Revolutionary and Napoleonic Wars made fresh calls on the Royal Navy. On "the glorious 1st of June," 1794, Howe virtually destroyed the French fleet, under Villaret Joyeuse, off Brest. Other great victories followed, notably those of Admiral Jervis and Commodore Nelson over the Spanish fleet off Cape St. Vincent, and Admiral Duncan over the Dutch at Camperdown.

Soon after, a mutiny occurred among the sailors at Spithead, who sought higher pay. Howe promised to meet the men's case and the trouble there ended; but, almost at once, a further mutiny began at the Nore. For more than a

month the movements of the fleet were held up. Public sympathy was not with the men and no help was forthcoming from Spithead. The mutiny broke down and the ringleaders were later hanged.

In 1798, at the battle of the Nile (*q.v.*) in Abukir bay, Nelson destroyed the French fleet, and Bonaparte and his army found themselves cut off in Egypt. A peace that was really only a truce was signed in 1802. War came again the following year and Napoleon prepared to invade England. Cornwallis and his admirals blockaded Brest and the Atlantic ports. Sir Robert Calder, attacking against heavy odds, took two French ships. On Sept. 15, 1805, Nelson left Spithead and arrived off Cadiz 13 days later. On Oct. 21, Villeneuve left harbour with 33 ships, and the battle of Trafalgar (*q.v.*), in which Nelson laid down his life, followed. The French fleet was cut into three divisions by the 27 ships under Nelson and Collingwood, and before the smoke of battle died away 20 French ships had been either sunk or captured.

Chesapeake and Shannon

The Royal Navy had heavy tasks in the Peninsular war. The 1812-14 war with the United States of America revealed weaknesses in British frigates, although the British ship won in the notable fight between the Shannon and the Chesapeake.

The modern Royal Navy may be said to date administratively from the 1830s when Sir James Graham and Sir Thomas Masterman Hardy were at the Admiralty. Strong naval action in 1882 gave the U.K. power in Egypt: following an uprising in which British residents in Alexandria were murdered, the British fleet, under Admiral Seymour, bombarded the city. The Suez canal was then seized, and Cairo occupied.

In the early days of steam, the Admiralty saw no virtue in this method of propulsion. Even at the time of the Crimean War, most of the vessels of the British fleet were still sailing ships. In 1860, H.M.S. Warrior, first of the "iron-clads," was launched. Of 9,210 tons, she had a radius of action of 1,210 m. at 10 knots. Her main armament was four 9-ton muzzle-loading rifled guns. She carried square yards on all her three masts and had a complement of more than 700. It was from the Warrior that new ships were evolved, until the Dreadnought set a fresh standard in 1906.

The frigate gave place to the cruiser, and the invention of the torpedo led to the building of a host of destroyers and torpedo-boats. Pioneer destroyer was the Havock, built in 1893. Of only 240 tons, she was nevertheless a big advance on the torpedo craft that had preceded her. In less than 14 years, the fleet included a destroyer of 1,800 tons, capable of 35 knots, compared with the 26 of the Havock.

Under and Over the Sea

Submarines were experimental until a comparatively short time before the First Great War. The Alose, built by the French in 1903, was only 60 tons. British craft of 1906-09 had grown to 316 tons, and the D-class, of 1912, were vessels of 620 tons. The advent of the aeroplane also affected the navy. While scientists, technicians, and naval architects worked to keep ahead in these new fields, the naval service provided skilled officers and ratings to man novel types and handle fresh weapons.

Lord Fisher of Kilverstone (*q.v.*), as first sea lord 1904-10, gave the navy its big gun ships, and instituted a sweeping reorganization and re-disposition of the navy. There was a political crisis over the navy estimates of 1909, but Fisher succeeded in getting the ships and the men the navy needed. Winston Churchill, appointed first lord of the Admiralty in 1911, continued the expansion of the navy. Nevertheless, when the First Great War came in 1914 the speed of ships and the range of guns made the task of Jellicoe (*q.v.*), *c.-in-c.* of the grand fleet, infinitely more difficult than those that had been faced by earlier British admirals. Opposing fleets at Trafalgar approached each other at a relative speed of six knots. At Jutland, in poor visibility, the relative speed was 40 knots. The difference in armament was if anything more striking. From the bridge of the Iron Duke, Jellicoe controlled 24 battleships in six columns. The moment of deployment into battle line of such forces called for one of the greatest decisions of any admiral in history. But the chief sea battles of the First Great War were fought against the U-boats. By ruthless sinking of merchant ships, these had by April, 1917, brought the U.K. to within six weeks of starvation. The Royal Navy opposed the German submarines not only with anti-submarine vessels but with new agents, such

as the depth charge and the hydrophone. Booms and barrage nets were installed in all narrow waterways, and the strait of Dover was closed to shipping. "Q" ships, which decoyed the enemy into the range of powerful guns hidden in apparently harmless merchantmen, had considerable success. Under Vice-Admiral Roger Keyes, one of the most daring and successful assaults of any war was made on Zeebrugge in order to block the canal and so deprive the Germans of their advanced U-boat bases on the Belgian coast.

The Royal Naval Air Service (*q.v.*) (later absorbed into the Royal Air Force) was developed during the First Great War; and later the fast light battle cruisers Furious, Glorious, and Courageous were converted into aircraft-carriers. They proved invaluable in the training of naval airmen between the two Great Wars.

Naval strength in personnel fell from 415,000 at the time of the 1918 armistice to 127,500 in 1921-22. The capital ship building programmes of the maritime powers were abandoned as a result of the Washington conference, 1922, the British Empire retaining 14 battleships and four battle-cruisers. The London Naval treaty, 1930, set new limits to cruiser strength. At the end of 1934, Japan gave notice of her intention to withdraw her adherence to this treaty; and in March, 1935, Hitler repudiated the disarmament clauses of the Versailles treaty, entering the same year into the Anglo-German naval agreement which gave the Germans the right to build up to 35 p.c. of the total tonnage of the British Commonwealth navies.

Rearmament and War

The efforts made in the 1920s to promote world disarmament having failed, the Admiralty set itself to the task of rearmament, and the maintenance of an efficient and up-to-date nucleus in all branches. A special study was made of night action at sea, with its problems of identification and communication. Anti-aircraft gunnery was developed, and new cruising formations, to meet the dangers of air attack, were worked out. The fleet was mobilised at the time of the Munich Crisis (*q.v.*), and thereafter the building of naval ships was speeded up. But when war broke out again in Sept., 1939, the Royal Navy was still dangerously short of some classes of vessels. In the main fleet at Scapa Flow were four

battleships, three battle-cruisers, and five cruisers. Ten older cruisers operated on the Northern patrol, and two battleships formed the main unit of a Channel force based on Portland. In the Mediterranean fleet were three battleships, three 8-inch cruisers, and several smaller cruisers. The convoy system was put into operation at once, stretching escort force resources to the utmost.

Naval Record, 1939-45

Throughout the Second Great War the Royal Navy, despite heavy losses, successfully hunted down large and small units of the German navy; set up a vast network of convoys all over the world, but in particular to N. America and, later, Russia; extricated and conveyed armies; and performed exploits similar to that of Zeebrugge by *e.g.* planting the old destroyer Campbeltown, filled with explosives, on the gate of the great dry-dock at German-occupied St. Nazaire. Of the many wartime developments, the coming into general use of radar (*q.v.*), which gave the sailor "sight" in darkness, fog, and foul weather, was one of the most remarkable, and was an important factor in *e.g.* the destruction of the Scharnhorst. Great advances in the air were accompanied by the production of fresh types of aircraft-carrier. Midget submarines were developed. The Fleet train, evolved by the Americans, which made it possible for fighting ships to be sustained at sea for long periods, was adopted by the Royal Navy when the main naval battle moved to the Pacific. Great Britain lost altogether 49,305 naval officers and ratings, and five battleships, eight aircraft carriers, 29 cruisers, 139 destroyers, 74 submarines, and more than 500 other war vessels.

Nearly half a million men joined the navy during the six years of war. Portsmouth, Devonport, and Chatham, the three great naval centres of England, were supplemented by scores of wartime training establishments, many far from the sea.

The general depots of the navy date from 1891—the press gangs had disappeared some 75 years earlier. From 1815, captains of newly commissioned ships obtained most of their crew by recruiting at a rendezvous—usually a public house—near the dockyard gates. A hulk was attached to each ship fitting out, and in the hulk the men had to live until their ship was ready. "I think

these hulks are the curse of the navy; they are uncomfortable and there is no discipline," said Admiral Sir Charles Napier, in 1858. Five years earlier, a class of petty officers had been established, on the recommendation of an Admiralty committee.

A naval barracks at Portsmouth was proposed in 1862, but the scheme was postponed and not revived until 1876. In 1879, the building of the Royal Naval Barracks at Devonport was begun; 24 years later, 4,000 officers and ratings marched from H.M.S. Duke of Wellington to take possession of the newly constructed barracks at Portsmouth. At that time, the fleet was still victualled on the old service system. The daily ration consisted of a fixed quantity of provisions for every man, valued at 9½d. A change was made to the "standard ration" system in 1907. A little later, general messing was introduced in ships and in barracks. Before the Second Great War, a rating putting in 22 years' service could expect to spend just over 8 years abroad, nearly the same time on home sea service, and 6 years on home shore service. After it, overseas commissions were reduced in length. New opportunities of promotion put flag rank within the reach of those beginning on the lower deck. There were also improvements in pay and conditions; but considerations, such as the opportunity to see the world and to qualify for a pension, were still emphasised in naval recruiting.

Tradition has played an important part in the development both of the navy, and of the Admiralty, which controls it. The lords commissioners of the Admiralty are the governing body, and the Admiralty is still the office of the lord high admiral. The board of Admiralty consists of the first lord (a cabinet minister), the first sea lord and other sea lords, who are admirals, the junior ministers, and the secretary to the Admiralty. There has been very little change in the organization of the board of Admiralty from the time of Pepys.

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of the Navy, 1914; Royal Navy, Lieut.-Commander Allan Baddeley, R.N., 1942; The Naval Heritage, David Mathew, 1944; Naval Broadcasts, Rear-Admiral R. K. Dickson, D.S.O., R.N., 1946; The British Navies in the Second World War, Admiral Sir W. M. James, G.C.B., 1946.

Royal New Zealand Air Force. Formed in 1926 from a nucleus of two squadrons of fighter aircraft lent by the R.A.F. This body was a component of the New Zealand military forces until 1937, when it was reconstituted as a separate organization under an air board. It had been granted the prefix Royal in 1934. At the outbreak of the Second Great War the R.N.Z.A.F. had a mobilised strength of 1,260 officers and men; most of its aircraft were army co-operation and training machines. The bulk of the personnel was transferred at once to Great Britain, where bomber and fighter wings were formed. R.N.Z.A.F. squadrons served on all battle fronts, notably in the bomber offensive against Germany and in the campaigns against Japan. In 1948 the strength of the force was fixed at two medium bomber squadrons, one flying boat, one fighter bomber, and one transport squadron, totalling 3,420 officers and men.

Royal New Zealand Navy. Fighting unit created in 1941 to replace the New Zealand squadron of the Royal Navy responsible to that date for maritime defence of the dominion, and paid for jointly by the British and New Zealand govts. By 1945 the R.N.Z.N. consisted of three cruisers, two destroyers, an armed merchant cruiser, minesweepers, and armed trawlers. N.Z. naval personnel totalled 10,000, of whom 5,000 served on dominion vessels, 4,000 with the Royal Navy, and 1,000 with the Fleet Air Arm. The Achilles, a cruiser of the N.Z. squadron, took part in the battle of the River Plate, Dec. 13, 1939. Other N.Z. ships served in the Mediterranean and the Pacific. In 1947 the strength of the R.N.Z.N. was established at 2,200 officers and men; the vessels included one cruiser, two corvettes, seven armed trawlers, and four light coastal craft. Except these last, all vessels are lent by the Royal Navy, and maintained by the N.Z. govt.

Royal Oak. Former British battleship. Completed in 1916 as a ship of the Royal Sovereign class, she displaced 33,500 tons on a length of 614½ ft. and a beam of 102½ ft. and was powered by

geared turbines developing 40,000 s.h.p. to give a maximum speed of 22 knots. She mounted a main battery of eight 15-in. guns and secondary armament of twelve 6-in., eight 4-in., four 3-pdr. guns, and 15 multiple machine-guns. She carried two aircraft and a complement of 1,234 officers and men. The Royal Oak took part in the battle of Jutland. In 1934 she was reconditioned at a cost of £1,000,000. While on non-intervention patrol in the Spanish Civil War she was hit by Nationalist A.A. fire. On Oct. 14, 1939, she was at anchor in Scapa Flow when a German submarine penetrated the defences and hit her with a salvo of torpedoes; she capsized and sank in 20 mins. with the loss of 800 officers and men.

Royal Opera House. Theatre in Covent Garden, London, built for the presentation of Italian opera. See Covent Garden.

Royal Parks. Enclosed spaces, laid out for pleasure and recreation, which are or were formerly part of the estates of the British royal house. They are administered by the ministry of Works and, within certain limitations, are open to the public. Notable are Windsor Great Park, and Hyde and St. James's Parks, London.

Royal Pioneer Corps. Corps of the British army. Established on Nov. 10, 1939, as the Auxiliary



Royal Pioneer Corps badge

Military Pioneer Corps, it was the successor to the labour battalions raised in the First Great War. It was placed under command of Major-Gen. L. W. Amps, and by the end of 1939 more than 1,000 men had been trained and joined the B.E.F. in France. Recruiting was at first restricted to men between 35 and 50 and to those, because of slight disability, below the medical standard of front line troops. Age and physical standards were later made the same as for other regiments.

Only 25 p.c. of the A.M.P.C. serving in France was armed, but the corps did splendid work in the defence of Boulogne and Dunkirk, once fighting a German armoured column with picks and shovels. Re-formed after Dunkirk as the Pioneer Corps, it became a fully combatant unit to work in cooperation with the Royal Engineers. In campaigns overseas

its constructional and docking companies were frequently called upon to fight beside the infantry. They manned the defences of the Kasserine Gap in Tunisia, 1943, and landed with the first assault troops at Salerno, 1943, and Anzio, 1944. Other units served in Burma, and an airborne battalion was formed as part of the Allied expeditionary force for the liberation of Europe.

In the U.K. the corps constructed depots, airfields, roads, railways, and anti-invasion defences and handled the greater part of the army supplies for D-day. Special companies were formed for clearance of air raid bomb damage, while units were in charge of smoke screen equipment used to hide vital targets from the air. The corps found most of the guards for prisoner of war camps. By 1945 it had a strength of 430,000 men, of whom 160,000 were recruited in the U.K. and included volunteers (used for home service only) of foreign birth, most of them German refugees, and 270,000 enlisted overseas, principally in Cyprus and Palestine.

In 1946 the corps was granted the prefix Royal and established as permanent.

Royal Regiment of Artillery. Official title of the British military unit described as Royal Artillery.

Royal School of Mines. London teaching institution. See Mines, Royal School of.

Royal Scots. Regiment of the British army. Raised in 1672 for the Scottish establishment, it became part of



Royal Scots.
Badge of the regiment

of the Scots brigade of Gustavus Adolphus in 1613. After the death of that monarch in 1632, it entered the French service and was amalgamated with a body of Scottish infantry raised in 1590 for the service of Henry of Navarre. While in the French service the regiment received its nickname, Pontius Pilate's Bodyguard, after a dispute about precedence with a Picardy regiment. It fought at Dunkirk in 1658, and at the Restoration was transferred to the English establishment by Charles II, who designated it the Royal or Scots Regiment and settled its precedence by numbering it the 1st Foot and senior infantry regiment of the line.

The Royal Scots served in Tangier in 1680 and with William III at Namur in 1695. It was with Marlborough at Blenheim, Ramillies, Oudenarde, and Malplaquet. It gained seven honours in the Peninsular War, and when conflict broke out with the U.S.A. in 1812 the regiment was shipped across the Atlantic to take part in the battle of Niagara. Back on the Continent it was in time for Waterloo. Further honours were won in the Crimean, Chinese, and South African Wars.

Thirty-five battalions of the Royal Scots were raised for service in the First Great War, and earned the battle honours: Le Cateau; Marne, 1914, '18; Ypres, 1915, '17, '18; Loos; Somme, 1916, '18; Arras, 1917, '18; Lys; Struma; Gallipoli, 1915, '16; Palestine, 1917, '18. In the Second Great War, remnants of the 2nd Royal Scots were captured after the fall of Hong Kong; the other regular battalion and the territorial battalions served in France, 1940, N. Africa, Italy, and the liberation of Europe. The regimental depot is at Glencorse, Midlothian.

Royal Societies Club. London club. Founded in 1894 at 63, St. James's Street, it now has a house at 35, Dover Street, W.1. Members must have some qualifications in the domain of literature, art, or science, or must belong to a university or other learned society.

In the early part of the 18th century there was a Royal Society Club, a dining club composed of a number of literary men. Its president was the president of the Royal Society, and its members included Gibbon, Reynolds, and Lawrence. The dinners were held until late in the 19th century, the places of meeting being Pontack's in Abchurch Lane, the Devil's Tavern, the Mitre, the Freemasons' Tavern, and the Thatched House Tavern.

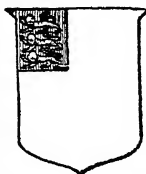
Royal Society, THE. Premier scientific society in the U.K., and oldest in the world with a continuous existence. It originated in a meeting in London, 1645, of a number of learned inquirers after knowledge, for the discussion of various speculations in natural philosophy and of experiments connected therewith. In 1648-49 some of the members

removed to Oxford, where they met in Dr. Wilkins's rooms at Wadham College. About ten years later most of them returned and resumed their meetings, with others who had stayed in London, at Gresham College, E.C., becoming organized in 1660 as a society, which, on April 22, 1662, was incorporated by Charles II under the title of The President, Council, and Fellowship of the Royal Society of London, for improving Natural Knowledge.

The Philosophical Transactions first appeared March 6, 1665, and the whole series presents a complete survey of the progress of scientific knowledge down to the present day. The society continued to meet at Gresham College, except for a short time at Arundel House, 1666-73, until 1710, when a move was made to Crane Court, Fleet Street. In 1780 the society moved again to rooms provided by the government in Somerset House, and in 1857 to its present home in Burlington House, Piccadilly. Since 1848 the honour of admission to the society has been jealously guarded.

Several medals are awarded each year in encouragement of scientific research and discovery. The Copley medal dates from 1731; the Rumford medal, for discoveries in light and heat, 1797; two Royal medals, 1826: Davy medal, 1877; Darwin medal, 1890. The list of presidents includes many famous names, from Newton, 1703, and Davy, 1820, to Huxley, 1883, Thomson (afterwards Lord Kelvin), 1890, Lister, 1895, and Rayleigh, 1905. See Academy; Burlington House; consult History of the R.S. to the end of the 18th century, T. Thomson, 1812; History of the R.S., 2 vols., C. R. Weld, 1848; The R.S., 1660-1940, Sir H. Lyons, 1944.

Royal Society of Arts, THE. Abridged name of a British learned society, the Royal Society for the Encouragement of Arts, Manufactures, and Commerce. Founded in 1754 and incorporated in 1847, it assists scientific and kindred interests by inviting eminent men of many schools of thought to lecture, by issuing a fortnightly journal, and by conducting examinations in commercial subjects and foreign languages. In 1936 the society inaugurated the distinction of royal designer for industry (R.D.I.), which can be held by not more than 40 people at any one time. The fine lecture hall at the society's h.q., 6-8, John Adam



Royal Society
arms

Street, Adelphi, London, W.C.2, was damaged by bombs during the Second Great War, but was reopened in 1947, when the number of fellows was some 5,000.

Royal Society of Edinburgh. Scottish learned society. It developed from a philosophical society founded in Edinburgh in 1739. In 1783 it received a charter of incorporation. Its constitution and aims are similar to those of the Royal Society in London. Headquarters are at 22, George Street, Edinburgh, and members are known by the letters F.R.S.E.

Royal Standard. Personal flag or banner of the British sovereign. It carries the Royal Arms (*q.v.*), and is flown with the three lions in the upper staff. This standard may be flown only from buildings and ships in which the sovereign is resident or which he is visiting. Use by private individuals, even as a street decoration, is illegal. See Flag colour plate facing p. 3392.

Royal Tank Regiment. Unit of the British army. It was established in 1916 as the Tank Corps

and was formed from a nucleus of Machine Gun Corps personnel to man the tanks used for the first time at the battle of the Somme. At the end of the First Great War it counted 35,000 officers and men and 2,000 armoured vehicles. In 1923 it was granted the prefix Royal, and in 1939 was incorporated in the Royal Armoured Corps as the Royal Tank Regiment. See Armoured Vehicles in Warfare; Tank.

Royalty. Originally a revenue or right belonging to the sovereign. There were a number of these in England in early days, among them treasure trove, and some remain today. The word is more generally used, however, for payments made to the owners of mining leases, patents, and copyrights for the right to work and sell such. Other royalties are fixed sums on each article or book sold. The word is also used for the state of being royal, and sometimes for the king and his family. See Royal Family; Wayleave.

Royalty Theatre. A former London playhouse, in Dean Street, Soho. It was built originally in 1840 for Miss Kelly's school of acting. Known later as The Soho and the New Royalty, it was

rebuilt in 1882-83, and again before it was reopened on Jan. 4, 1905, by Gaston Mayer, who gave several seasons of French plays in which Sarah Bernhardt appeared. The theatre closed in 1938.

Royal Ulster Constabulary. This body is described under Ulster Constabulary, Royal.

Royal Warrant. See Warrant.

Royal William. First vessel to cross the Atlantic under steam only. The Savannah, which made

a fortress church, built in the 10th-12th centuries, and remains of a Roman bath. Alkaline and arsenical thermal springs, and beautiful environs, attract many visitors. Pop. 1,700.

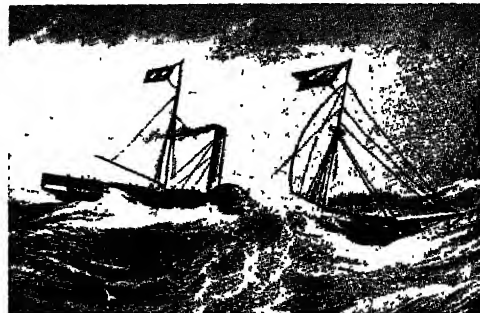
Royce, SIR (FREDERICK) HENRY (1863-1933). British engineer. Born March 27, 1863, he was first apprenticed to the Great Northern rly., and later employed at a Leeds gun factory. He studied electricity with such success that

he was made an electrical engineer for the city of Liverpool. At 21 he founded in Manchester his firm of mechanical and electrical engineers. His first two-cylinder 10 h.p. motor car appeared in 1904. He met C. S. Rolls, a racing motorist, who entered into partnership with him, and in 1907 there came into being

Rolls-Royce, Ltd., which developed as the manufacturers of the world's finest car. Royce was created a baronet in 1930, and died April 22, 1933. A Life by Max Pemberton appeared in 1934.

Royce, JOSIAH (1855-1916). American philosopher. Born in California, Nov. 20, 1855, he was educated at the university of California, and in Germany. In 1878 he returned to his own university as a tutor, first in English and then in philosophy, and in 1892 was made professor of philosophy. In 1914 he went to Harvard as Alford professor of natural religion and moral philosophy. Royce taught objective idealism, that the relation between the subject and the object of thought is one of absolute identity and of logical voluntarism. All logic is logic of the will; truth is instrumental so far as it is a means of obtaining the object of all human willing. There is no pure understanding; thinking is a mode of action and an idea is a plan of action. Morality consists in free, active loyalty to a thing or community. Royce died Oct. 4, 1916.

Royden, AGNES MAUDE (b. 1876). British social worker and preacher. Daughter of Sir T. Royden, Bart., she was educated at Cheltenham and Lady Margaret Hall, Oxford, and worked at the Victoria women's settlement, Liverpool, and lectured in English



Royal William. The first vessel to cross the Atlantic under steam only, 1833

By courtesy of the City of Dublin Steam Packet Co.

the voyage in 1819 from Georgia to Liverpool, although fitted for steam, sailed two-thirds of the way and steamed the remainder. The Royal William, built at Quebec in 1831 by John Goudie, a native of Greenock, Scotland, was 176 ft. long over all, 43 ft. 10 ins. in beam, and 17 ft. 9 ins. deep inside the hold. Under command of Capt. John McDougall, she left Quebec Aug. 4, 1833, and reached Liverpool in 25 days. On the voyage she consumed 330 tons of coal. Sold for £10,000 at the end of 1833, the vessel was first chartered by the Portuguese government, who declined to purchase her for their navy. Next year she was bought for the Spanish fleet, and under the name of Ysabel Segunda became the first war steamer the Spaniards possessed.

Royan. Fishing village of France, in the dept. of Charente-Inférieure. At the mouth of the Gironde, its S. aspect and its fine sands made it a popular bathing resort, attracting annually thousands of visitors. There was a small harbour, and sardine fishing and a coasting trade were carried on. The village was completely wrecked during the Second Great War. See Gironde, La. Pop. 9,300.

Royat. Health resort of France, in the dept. of Puy-de-Dôme. It stands on the Tiretaine, at an alt. of 1,495 ft., about 2 m. by tram S.W. of Clermont-Ferrand. It has



Royal Tank Regiment badge

literature to the Oxford university extension delegacy. In 1908 she became an active member of the



Maude Royden.
British social worker

women's suffrage movement, editing *The Common Cause* until 1914. She preached at the City Temple, 1917-20, and at the Guildhouse, Eccleston Sq., London, 1920-36, founding with Percy Dearmer the fellowship services at Kensington. She became C.H. in 1930. In Oct., 1944, Maude Royden married the Rev. G. W. H. Shaw, who died Nov. 30 in the same year. Her many books on religious and sociological subjects included *Women and the Sovereign State*; *Prayer as a Force*; *Here and Hereafter*. An autobiographical work, *The Threefold Cord*, appeared in 1947.

Royde-Smith, NAOMI GWLADYS. Contemporary British writer. Educated at Clapham high school and Geneva, she was literary editor of the *Westminster Gazette* during 1912-22, attracting attention by setting ingenious competitions. Retiring from journalism, she made her reputation as a novelist with *The Tortoiseshell Cat*, 1925; other stories included *The Delicate Situation*, 1931; *The Queen's Wigs*, 1934; *Mildensee*, 1943; *Fire-Weed*, 1945. Of her biographies the best-known was *Portrait of Mrs. Siddons*, 1933. She married the actor Ernest Milton.

Royer-Collard, PIERRE PAUL (1763-1845). French philosopher and statesman. Born at Sompuis, Marne, June 21, 1763, he at first supported the Revolution, but was proscribed and in hiding during the Terror. In 1797 he was



P. P. Royer-Collard, on the council French philosopher of 500. Professor of philosophy in Paris, 1811-13, he founded the *Doctrinaire (g.v.)* school in philosophy and politics, being himself a speculative rather than a practical politician. He led the reaction against the sensualism of Condillac, and introduced the views of the Scotsmen Reid and Stewart to France. He sat in the chamber of deputies, 1815-39, becoming president 1828,

and was president of the commission of public instruction, 1815-20. He died Sept. 4, 1845.

Royston. Market town and urban dist. of Herts, England. It is 12 m. N.E. of Hitchin, with a station on British rlys. (E. section). An Augustinian priory was founded here in the 12th century, and its church is the existing parish church of S. John the Baptist. The town has a market house. In 1742 there was discovered a hermit's cave, containing carvings of the Crucifixion, etc., and many relics of the Romans have been found. James I built a palace here. The Royston crow is another, and local, name for the hooded crow, a species that visits towns in winter. Annual fairs are held. Market day, Wed. Pop. 5,000.

Royston. Urban dist. of the W. Riding of Yorks, England,



Ruapehu, New Zealand. Distant view of the volcanic cone in North Island

4 m. N. of Barnsley, with a rly. station. The chief buildings are the church of S. John the Baptist, restored in 1859, and the grammar school, founded 1607. Pop. 7,750.

Royston. Urban dist. and market town of Lincs, England. It is 3 m. by rly. N.W. of Oldham. The chief industry is cotton manufacture. Market day, Thurs. Pop. 15,000.

R.S.F.S.R. Largest republic in the Soviet Union, covering about three-quarters of the total area and stretching from the Arctic to the Black Sea and from Leningrad to the Far East. The Russian Soviet Federal Socialist Republic was given its first constitution in 1918 and this was a model for all republics later incorporated in the union. New constitutions were adopted in 1925 and 1937. In 1948 the republic was organized in six territories, 51 regions, five autonomous regions, and twelve autonomous republics. For topography, history, industry, etc., see Russia.

Ruabon OR RHUWABON. Town of Denbighshire, Wales. It is 5 m. by rly. S.W. of Wrexham. The chief building is the church of S. Mary, in which are monuments to the Wynn family, whose seat,

Wynnstay, is near. Bricks, tiles, and chemicals are manufactured, while coal and iron ore are mined in the vicinity.

Ruanda-Urundi. Territory, formerly in German E. Africa, assigned to Belgium as mandatory by the League of Nations. Administratively it was united with the Belgian Congo 1925, the frontiers having been ratified in 1924. It is now bounded N. by Uganda, E. by Tanganyika Territory, and W. by Lake Kivu. It is inhabited by three races, the Bak-utsi, the Bahutu, and the Batwa. The N. is a volcanic area with large subterranean caves. Usumbura is the capital. The total territory transferred from German to Belgian administration covered about 19,000 sq. m. Pop. 3,386,362.

Ruapehu. Mt. of North Island, New Zealand. A volcanic cone, 9,068 ft. alt., it was in eruption in

1895 and 1945. With Mt. Tongariro and other peaks, it constitutes a national park, the territory of which was given to the New Zealand government by the Maori chief, Te Heuheu Tukino, in 1887.

Rubáiyát. Plural of rubai, a Persian word meaning quatrain or verse of four lines in which the first two and fourth lines rhyme. One quatrain or stanza is a rubai, and a number of verses or complete poem is a Rubáiyát. The best known is the Rubáiyát of Omar Khayyam, translated into English by Edward FitzGerald. Another well-known example is the Rubáiyát of Abu Said. See FitzGerald, E.; Omar Khayyam.

Rubato (It., robbed). Musical term. It indicates a subtle variation of the tempo which the performer is to use at his discretion in order to gain in expressiveness and grace, as time which is inflexibly strict sounds mechanical and stiff. Rubato is thus a necessity in all artistic performance, but some composers, notably Chopin, call for it more than others. Without a sensitive appreciation of rhythm and a keen insight into the structural balance of the composition, it may degenerate into an exhibition of bad time and poor musicianship.

RUBBER: NATURAL AND SYNTHETIC

This article deals with the various stages in the production of natural rubber from planting to manufacture, and describes also the development and uses of synthetic rubber. See also Macintosh, C.; Motor Car; Plastics; Tire

The first known references to rubber occur in a work of P. Martyr of Anghiera, published in 1525, which contains a description of some rubber balls he had seen used by the people of Mexico for their sports. Sahagun described the balls as having been made from a black resin obtained from certain trees. Not until the year 1736, however, did La Condamine, a member of an expedition sent to S. America, bring back specific information about rubber-bearing trees, and the methods by which the natives obtained rubber from them. Dr. Priestley in his work on Perspective (1770) mentions it as useful for "wiping from paper the marks of a blacklead pencil" (hence its name, for rubbing out pencil marks was the first use to which the material was put in Europe), and that a cubical piece of about half an inch could be obtained for 3s.

Towards the close of the 18th century the first known attempts were made to use rubber in industry. In 1791 Samuel Peel, a citizen of London, patented a process for waterproofing cloth by spreading rubber dissolved in turpentine over it; but the garments produced by this means were both sticky and smelly. Many other unsuccessful attempts were made before in 1823 Charles Macintosh, of Glasgow, succeeded in producing waterproofed garments free from the objectionable defects of previous attempts. This success laid the foundations of the rubber industry. Independently (c. 1842-43) T. Hancock, of London, and C. Goodyear, of Newhaven, U.S.A., discovered that by vulcanisation, i.e. subjecting rubber to the combined action of sulphur and heat, it could be freed from stickiness, gained greatly in strength and elasticity, and would withstand climatic influences.

Original Sources of Supply

For a considerable time S. America, more especially Brazil, was the sole source of supply. The rubber was procured in a rough and ready fashion by the natives who slashed the wild rubber trees with small axes, and collected the latex which dropped from the cuts in small cups. Later in the day the contents of these cups was emptied into buckets, and the rubber was cured by repeatedly dipping a

paddle into the buckets of latex, and revolving the paddle over a smoky fire of bark and nuts. The principal tree from which rubber was obtained was *Hevea brasiliensis*; but other trees in various localities also yielded rubber, e.g. various species of *Manihot*, producing cerea rubber, and the *Castilloa elastica* of central America. Later it was discovered that there were many rubber-bearing trees and vines in Africa and Madagascar, in particular in the Congo district (*Landolphias*). On account of the general excellence of its quality fine hard Para was preferred above all other rubbers.

Seedlings Grown at Kew

But there was a limit to the quantity of rubber procurable by haphazard gathering from wild trees, and the authorities at Kew Gardens determined to try to procure seeds of *Hevea brasiliensis* from the Amazon districts and transplant them in British possessions in the Far East. Of 70,000 seeds brought from Brazil in 1876, less than 2,000 produced seedlings; but these were sent to Ceylon in 1877, and from them have come the hundreds of millions of rubber trees grown and growing in Malaya, Indonesia, and Ceylon. (By 1910 some half million acres had been planted; by 1947, about 8½ million acres, some 40 p.c. in Malaya.) During the Second Great War, after Japan had overrun the rubber plantations in Malaya and the Netherlands Indies, 1941-42, collection of wild rubber was stimulated both in S. America and central Africa, and search was made for suitable rubber producing plants of quicker growth than *Hevea brasiliensis* both in central America and Asiatic Russia; but the production from these sources remained relatively small, and both the Allies and Germany met most of their wartime needs for rubber with the synthetic product (*v.i.*).

The serious demand for rubber began to develop with the invention of the pneumatic bicycle tire in 1888; but it was the rapidly expanding need for rubber for motor car tires, dating from the opening decade of the 20th century, that stimulated the development of rubber plantations in the Far East, particularly in Malaya and Java. In 1850 the output of rubber was estimated at 1,000

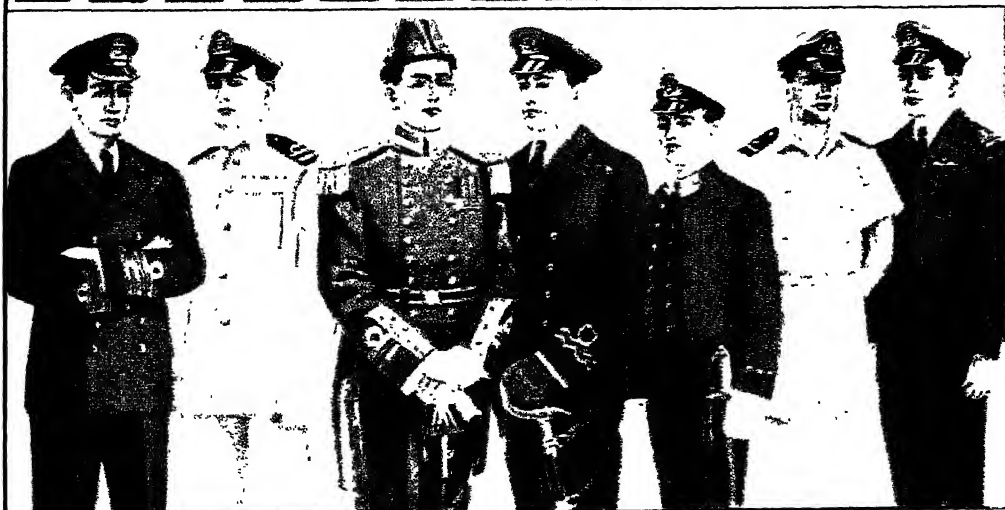
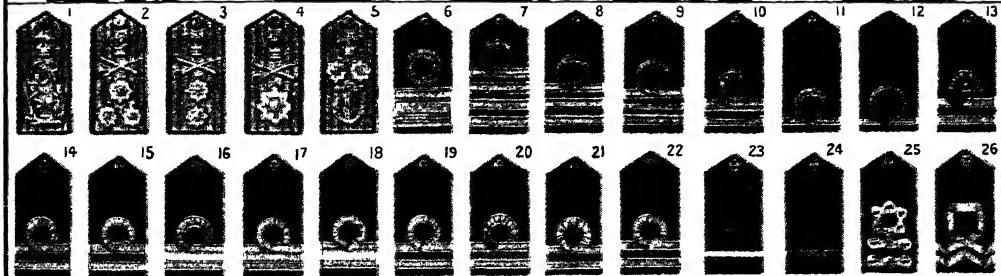
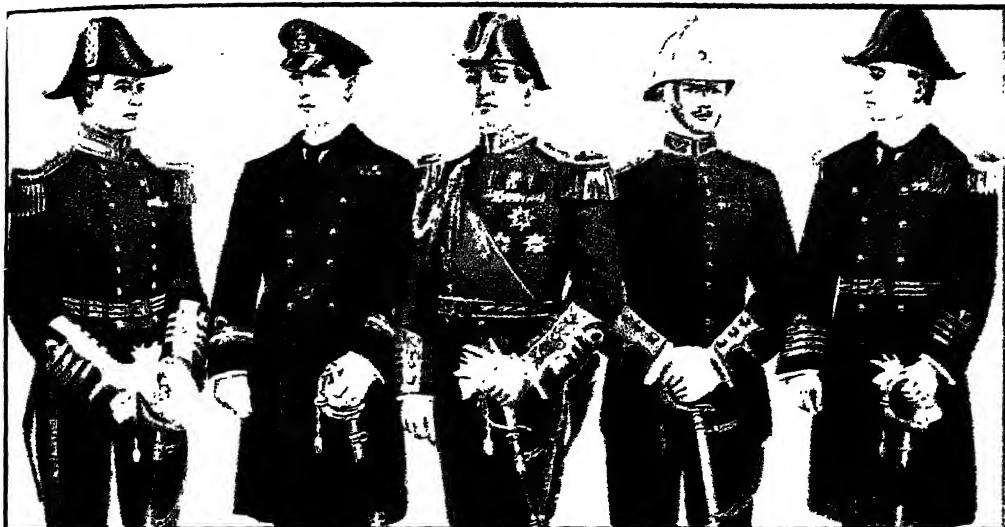
tons. In 1900 it had risen to 30,750 tons, and in 1920 to 295,000 tons. In 1927 the output was estimated at 643,000 tons, 605,000 from plantations; in 1937 1,135,000 tons, almost all from plantations. The world's 4 million motor vehicles in 1937 required about 750,000 tons for tires.

There is scarcely any art or industry or sport in which rubber is not used in some form or other. Thomas Hancock, a pioneer in the rubber industry, put india-rubber to use for e.g. elastic springs for gloves and braces. The invention of rubber thread was an important development, for this can be woven into fabrics from which a great variety of surgical and domestic apparatus and apparel is made. Other important uses of rubber are for hose pipes and tubing, valves, buffers and engine packing, hot water bags, gas bags, cushions, belting, gloves, electrical fittings, rubber balls, sponges, vulcanite combs, boot soles and heels, and the insulation of telegraphic wires and cables.

PLANTATION RUBBER. The laying out of a rubber plantation requires first the felling and burning of the jungle, and the digging out of tree roots. Rubber seeds, seedlings, or stumps, i.e. large seedlings grown in nurseries and stumped by cutting off the top and the end of the tap root, can be planted. The last is a very convenient form of planting, as while the ground is being cleared seedlings can be grown close together in large numbers ready for planting out as stumps as opportunity offers. One hundred trees per acre is a convenient number to plant; later on, when they have developed their root system and foliage and have become crowded, they must be thinned to about 70 per acre.

Method of Tapping

The young plants grow rapidly, and by the time they are five or six years old should have attained a girth of about 20 ins. at 3 ft. above the ground. This is a suitable size of tree on which to begin tapping, i.e. paring away thin shavings of bark with some simple instrument, usually a farrier's knife. Two or 3 ft. above the ground a V-shaped cut is made in the bark along the trunk of the tree at an angle of 45° to a channel which runs vertically down the trunk of the tree to the ground, where the latex, a milky fluid which flows from the cut, is received in a cup or cups. The average rubber content of latex is 35 p.c., the

CAPTAIN
FULL DRESSLIEUT. (a)
FROCK COATADMIRAL
FULL DRESSCAPTAIN R.M.
FULL DRESSCAPTAIN
FROCK COAT WITH EPAULETTESSURGEON-COMMANDER
UNDRESSLIEUT
WHITE UNDRESS
(TROPICAL)LIEUT.-COMMANDER
FULL DRESSLIEUT. R.N.V.R.
UNDRESSMIDSHIPMAN
ROUND JACKETSUB-LIEUT
TROPICALLIEUT (a)
WORKING
DRESS

Centre panel shows rank insignia worn on greatcoat shoulder straps. Executive Officers: 1 Admiral of the Fleet, 2 Admiral, 3 Vice Admiral, 4 Rear-Admiral, 5 Commodore (1st Class), 6 Commodore (2nd Class), 7 Captain, 8 Commander, 9 Lieutenant-Commander, 10 Lieutenant, 11 Sub-Lieutenant, 12 Warrant Officer, 13 Lieutenant, Fleet Air Arm. Non-Executive Officers: 14 Lieutenant (Surgeon), 15 Lieutenant (Dental), 16 Lieutenant (Supply), 17 Lieutenant (Instructor and School

master), 18 Lieutenant (Shipwright), 19 Lieutenant (Ward master), 20 Lieutenant (Electrical), 21 Lieutenant (Engineer), 22 Lieutenant (Ordnance), 23 Midshipman (Supply), 24 Midshipman (Engineer). Insignia for non-executive officers of rank above warrant is the same as that for executive officers, but with the appropriate coloured strip between the gold bands. 25 Lieutenant (Royal Naval Reserve), 26 Lieutenant Royal Naval Volunteer Reserve.

ROYAL NAVY: UNIFORMS AND RANK INSIGNIA OF OFFICERS

CHIEF PETTY OFFICER
SMOKER MECHANIC
DRESS NO. 1

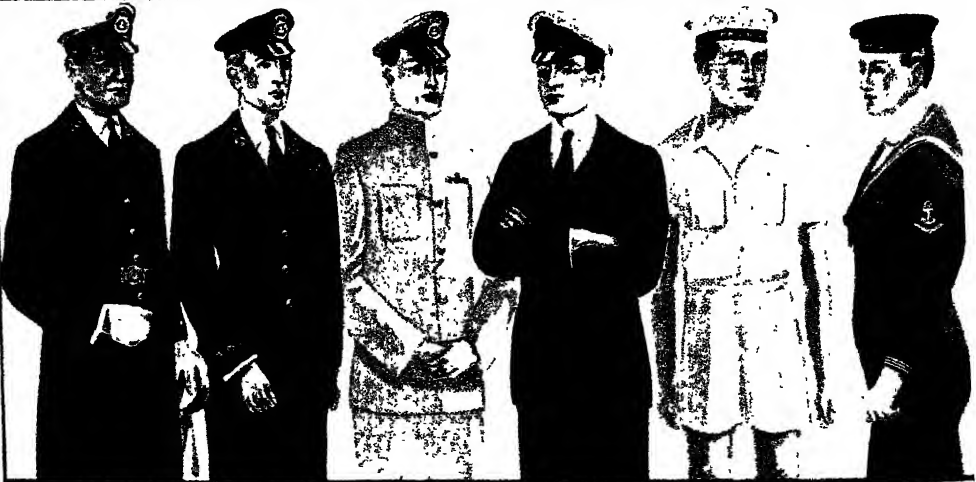
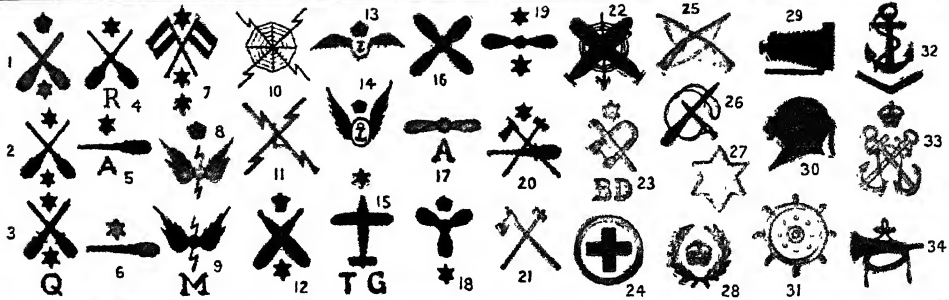
R.M. CORPORAL
UNDRESS ORDER

ROYAL MARINE
REVIEW ORDER

PETTY OFFICER
SIGNALS
DRESS NO. 1

TELEGRAPHIST
TROPICAL DRESS

RATING OBSERVER
WORKING DRESS



MASTER-AT-ARMS
DRESS NO. 1

GUNNER'S MATE
WORKING DRESS

PETTY OFFICER PILOT
TROPICAL DRESS

LEADING WRITER
WORKING DRESS

SEAMAN
TROPICAL DRESS

LEADING SEAMAN
DRESS NO. 1

Centre panel shows badges of rank or rating worn on the sleeve by petty officers and men and on the collar by chief petty officers. In Nos 1 to 6 the crown is used to denote the rank of petty officer or above, the appropriate letter indicates the qualifications of the wearer, and the star or stars an advancement in that qualification. 1. Gunner's mate. 2. Director Layer and Gun Layer (1st Class). 3. Quarters, Layer, Control and A.A. Rating (1st Class). 4. Same, 2nd Class (Radar Control). 5. Same, 3rd Class (A.A.). 6. Seaman Gunner. 7. Visual Signaller (2nd Class). 8. C.P.O. Telegraphist. 9. Radio Mechanic. 10. Radar Plot Rating.

11. Electrical Rating. 12. Physical and Recreational Instructor (1st Class). 13. Rating Pilot. 14. Rating Observer. 15. Telegraphist Air Gunner (1st Class). 16. Air Fitter. 17. Air Mechanic. 18. Mechanician. 19. Motor Mechanician. 20. Chief Armourer. 21. Shipwright. 22. Torpedo and Anti-Submarine Branch. 23. Chief Rigger (Boon Defence). 24. Sick Berth Attendant. 25. Good Shooting Badge. 26. Sailmaker. 27. Accountant Branch. 28. Regulating Branch. 29. Photographer. 30. Diver. 31. Quartermaster. 32. Leading Seaman and Good Conduct Badge. 33. P.O. 34. Bugler. Badges are gold, red or blue according to dress.

ROYAL NAVY: UNIFORMS AND BADGES OF PETTY OFFICERS AND MEN

[See over



Rubber. 1. Seed and seedling of *Hevea brasiliensis*. 2. A plantation in Sumatra with seven-year-old trees and seedlings mixed. 3. Using the tapping knife. 4. Full spiral tapping with three 22 oz. cups in position for collecting the yield. 5. Latex passing through sieves and pipes into bulking tanks. 6. Diluted latex from bulking tanks passing by chute to coagulating tanks. 7. Lifting coagulum from the tanks. 8. Coagulum passing through a six-in-one sheeting machine. 1. from *The Rubber Cultivation on the East Coast of Sumatra*, J. H. Roodekewit; 2, 5, 6, 7, 8, by *Harrisons and Crosfield*; 3, 4, by *Dunlop Rubber Co.*

highest recorded content of *Hevea* latex being 69.5 p.c. taken from 30-year-old trees after a long rest period. Raw rubber is a hydrocarbon (isoprene) polymer, and has the empirical formula C_5H_8 .

In early years it was thought that the more cuts on the bark, the more rubber would be collected, but it was soon found that after a first cutting the bark did not renew itself well, and that overtapped or badly tapped trees were apt to become overgrown with warty growths and to be attacked by various fungoid

diseases. The usual system adopted later was to make successive V-cuts, first on one half of the tree trunk, then on the other. This means that it is 6-8 years before tapping begins again on the first side, which allows time for the bark to renew itself. A good yield from a young tree of from 20 to 25 ins. in circumference 3 ft. from the ground would be 2½ to 3 lb. of dry rubber per annum. Trees are usually tapped on alternate days. Tapping is started early in the morning, and when the tapper has

finished his task of, say, 300 to 350 trees, he empties the contents of all the cups into a galvanised iron bucket and carries it to the factory. The latex is carefully strained through sieves into a large receptacle tank, where a small percentage of formic or acetic acid is added and well mixed to cause coagulation. The latex rapidly coagulates into white cheesy slabs which are washed in water and then rolled into sheets. These sheets are hung on racks in the shade to dry. More frequently than not, during

this process they are well smoked. When thoroughly dry the sheets are carefully packed in chests each containing about 2 cwt. and are then ready for export.

The use of "reclaimed rubber" recovered from old tires, etc., corresponds to the use of "shoddy" in the woollen industry. The rubber so recovered has not the same high degree of tensile strength as has new rubber, but is useful for many purposes, such as rubber heels and rubber tiling for floors.

SYNTHETIC RUBBER. Relatively simple hydrocarbons can be caused to polymerise under certain conditions to yield rubber-like masses. The processes involved are relatively costly, so that it was only in Germany, the U.S.A., and the U.S.S.R. that serious attempts were made during the 1930s to put "synthetic" rubber on a fully commercial basis. With the over-running of the rubber producing areas in the Far East by the Japanese in 1941-42, what had been an expensive luxury became an essential war material, and in the U.S.A. plans were made for producing more than 1,000,000 tons per annum.

Uses of Synthetic Rubber

According to a statistical survey made in 1938, synthetic rubber could already be substituted for the natural product 769 times out of 1,000 in the mechanical goods field; but while the intensive development of the war years established the synthetic material for peace as well as war purposes, experience has demonstrated that the natural material could hold its own. Natural rubber is superior in processing properties, resilience and elasticity, resistance to tears and cuts, and reasonable maintenance of elastic properties at low temps. The synthetic materials, on the other hand, are superior in their resistance to deterioration by oils and organic solvents, resistance to ageing, and low permeability to liquids and gases.

The term synthetic rubber is applied somewhat indiscriminately to 40-50 different synthetic products having rubber-like properties sometimes called elastomers. Early attempts to synthesise rubber started with isoprene, but energy was soon diverted in other directions, and in particular to butadiene. A derivative of this was the basis of the first commercial synthetic rubber produced, 1931, in the U.S.A., neoprene, the polymer of chloroprene which is chemically

2-chloro-1:3-butadiene. It was found that the properties of the products varied considerably according to the method of polymerisation (*q.v.*) and this gave rise to different commercial types, the most important being neoprene E, G, and G.N.

Butadiene Elastomers

A large number of elastomers have been prepared from butadiene, which is obtained from petroleum or alcohol. According to American statistics the U.S.S.R. was producing 60,000 tons of these elastomers in 1939 under the designations S.K.A. and S.K.B.; the corresponding German grades buna 85 and 115 were then regarded as virtually obsolete. By far the most important member of this family is buna.S, which under the designation GR.S. accounted for the bulk of American wartime output. Buna.S is a co-polymer of butadiene with 25 p.c. styrene, and has a specific gravity of 0.92. It is said to be far superior to rubber in heat and abrasion resistance, and a buna.S tire tread is said to be 35 p.c. better than the best natural rubber tread.

Another interesting series comprises the co-polymers of butadiene and acrylic nitrile. The material, which has a nitrogen content of 7 p.c. and corresponds to 25 p.c. acrylic nitrile, is called perbunan.

Allied to the elastomers are materials styled elastenes, obtained by the polymerisation of ethylene, propylene, and isobutylene. The solid polymers of ethylene are known under the generic name polythene; this is more wax-like than rubber-like, but its properties can be modified by co-polymerisation with isobutylene. Polymers of this material are of considerable commercial significance. Chemically, however, they have no relationship whatever to rubber or to any of the elastomers.

Another important group of materials having only the limited amount of unsaturation required for vulcanisation are called generically butyl rubber. They are co-polymers of olefinic materials with a small amount of diolefin. Butyl rubber describes a hydrocarbon product with an unsaturation less than 5 p.c. of that found in natural rubber, and having a molecular weight between 40,000 and 80,000.

The ethenoid plastics include the polymers and co-polymers of vinyl chloride, alcohol and acetate, vinylidene chloride, and the

acrylic ester polymers. These are called by a variety of trade names, but the name P.V.C. (polyvinyl chloride) is the most common synonym for synthetic rubber. P.V.C. has been widely used for cable coverings, and in sheet form is used for curtains, waterproof garments, etc.

Thioplasts, or thiokols, are rubber-like plastics based on ethylene polysulphide. With few exceptions these materials possess the pungent and characteristic odour associated with sulphur compounds, so that they are in the main limited to purely industrial applications. They are characterised by their extreme chemical inertness. They are thermoplastic and can be applied as coatings by means of the Schori flame "gun."

Sometimes included with the rubber-like materials are the soft plastics obtained from highly plasticised ethyl cellulose, but such a classification is neither accurate nor logical. Such materials are tough and soft, but they lack the elasticity of the true synthetics. They have nevertheless attained considerable commercial success as coating compositions for fabrics and braids, and also as "strip-coatings" for metal tools and plant.

MODIFIED RUBBER. This is obtained by compounding natural rubber with some of the synthetic products. For certain applications such compounds have been found to have qualities which make them superior to both the natural and the synthetic products. A mixture of butadiene and natural rubber vulcanised in the presence of lampblack is used for motor car tires.

Bibliography. Rubber: Physical and Chemical Properties, Rubber Research Association, 1935; Handbook of Plastics, H. R. Symonds, 1943; Modern Synthetic Rubbers, H. Barron, 1945.

Rubber Regulation Committee, INTERNATIONAL. Established in 1934, representing Great Britain, France, the Netherlands, India, and Siam, to limit rubber production so that it would not exceed consumption. Production had for some years been rapidly increasing, and the price had therefore fallen so heavily that both growers and financiers were faced with ruin. The committee agreed on a total production figure for a period, and on the quota to be produced by each country. It regulated stocks held by producers, and the amount of fresh

planting. The price of raw rubber, which was 2½d. a lb. in 1931, was stabilised at about 7d. a lb. The agreement was renewed for five years from 1938, but the conquest of Malaya, 1941, and the N.E.I., 1942, by Japan stopped the committee's activities.

Rubble. Masonry built of unwrought or partly-wrought stone. Dry rubble, built without mortar, is used in many parts of Great Britain for low walls, sometimes with a coping bedded in mortar. Rubble built with mortar is also common in some districts. Random rubble is built without courses, the stones being arranged irregularly so as to afford bond, and the bond aided by longer stones which go entirely or partly through the wall at intervals. At angles and openings, wrought stone quoins (angle stones) generally occur. In coursed random rubble the stones are built in to level off at vertical heights of 12 to 18 ins. Rubble may be built entirely in courses, when every row of stones is roughly squared, though different courses may vary in height. In polygonal rubble no attempt is made to arrange the stones in horizontal courses, but they are fitted together approximately on the face of the wall. Sneaked rubble is of squared stones varying in height and length and arranged horizontally. Rubble is also used as a filling behind stone in walls and piers. See Ashlar; Masonry.

Rubbra, EDMUND (b. 1901). British composer. Born at Northampton, May 23, 1901, he began composing at 14, and attracted the attention of Cyril Scott, who gave him lessons. He later studied at Reading university and the R.C.M., where he was a pupil of Holst. His works included five symphonies; Triple Fugue; La Belle Dame Sans Merci (chorus and orchestra); The Mystic Trumpeter (double chorus and orchestra); Sinfonia Concertante (piano and orchestra); choral settings of medieval Latin lyrics; orchestral version of Brahms's Handel variations; and numerous songs.

Rubefacients (Lat. *rubefacere*, to make red). Drugs which, when applied to the skin, cause it to become red owing to dilatation of the peripheral vessels. They are used in medicine as constituents of ointments to produce counter irritation in inflammatory conditions. Iodine, camphor, carbolic acid, and volatile oils are those most frequently employed.

Rubellite (Lat. *rubellus*, reddish). Pale red or pink variety of tourmaline (*q.v.*). When pure in colour and transparent it is sometimes cut as a gemstone.

Rubens, PAUL ALFRED (1875–1917). British composer. Born in London, April 29, 1875, he was educated at Winchester and studied law at the Inner Temple. His real talent, however, was for writing tuneful lyrical music for the stage, and he became one of the most successful composers of musical comedy. Among his successes were musical numbers for *Florodora*, 1899; *A Country Girl*, 1902; *The Cingalee*, 1904; *Miss Hook of Holland*, 1907; *The Balkan Princess*, 1910; and *The Girl from Utah*, 1913. He died at Falmouth, Feb. 5, 1917.

Rubens, PETER PAUL (1577–1640). Flemish painter. Rubens was born June 29, 1577, at Siegen, Westphalia, where his father, a prominent citizen of Antwerp, was living in exile. After his father's death, 1587, Rubens went to Antwerp, where he served for a



Peter Paul Rubens,
Flemish painter
Self-portrait

time in the Lalaing household and began his artistic studies. He worked under Verhaeght, van Noort, and Otto van Veen or Voenius, the last an influential court painter who helped him to go to work further in Italy, 1600. He painted in Venice, Mantua, Rome, Florence, Milan, and Genoa, returning to Antwerp in 1608.

His Italian experience brought his powers to maturity. Before long he was recognized as one of the greatest painters of the day, and commissions came to him from every part of Europe. He had extraordinary energy, and executed paintings and cartoons in bewildering profusion, and with growing ability. At the same time Rubens was a man of wide culture, and several times engaged in diplomacy. In 1605 he had been sent on a mission to Madrid, and he carried out missions at Delft, 1626, Madrid, 1628, London, 1629, where he was knighted by Charles I, and at The Hague, 1632. His wives, Isabella Brant (d. 1626), and the beautiful Helena Fourment, whom he married as a girl of 16 in 1630, appear in many of his pictures. He died May 30, 1640.

Rubens is credited with about 1,250 authentic works; most of the world's great galleries contain examples of the master. Brussels, Antwerp, and Vienna have some great masterpieces, and the National Gallery, London, contains over 30 works. His painting marks the highest development of the Flemish school: elaborate composition, often on a large scale, a glowing richness and variety of colour, and a quickness of imagination which overcomes the formalism of many of his subjects. Seen in galleries, his work sometimes may impress the spectator by a rhetorical quality, but it should be remembered that he painted, as it were, for large spaces and crowds, designing his effects for the walls of churches and palaces. Among the famous pupils who carried on his tradition, and in their youth helped the master with his work, were Van Dyck, Jordaens, De Vos, and Teniers. See Ambrose, S.; Arundel, Earls of. *Consult Life*, Max Rooses, 1903, Eng. trans. 1904; Rubens, Painter and Diplomat, E. Cammaerts, 1932; *The Sketches of Rubens*, L. van Puyvelde, 1948.

Rubiaceae. Extensive family of trees, shrubs, and herbs. Mostly natives of the tropical and sub-tropical regions, they have undivided leaves, opposite, or in whorls. The flowers are regular, funnel-shaped, wheel-shaped, salver-shaped, or bell-shaped. The order includes many economically important plants, such as coffee, Peruvian bark, madder, and such ornamental plants as the bouvardia and gardenia; also the bedstraws and woodruff of the countryside.

Rubicon (mod. *Rugone* or *Urgone*). In ancient geography, a stream forming the boundary between Italy and Cisalpine Gaul. Its crossing by Julius Caesar began the Roman civil war, 49 B.C. In modern language, the phrase to cross the Rubicon is equivalent to burning one's boats, taking an irrevocable step. See Caesar, Julius.

Rubidium (Lat. *rubidus*, dark red). One of the rarer metal elements. Its chemical symbol is Rb; atomic weight, 85.43; atomic no., 37; specific gravity, 1.52; melting point 38° C.; and boiling point 696° C. It is silvery white in colour and is soft and wax-like in consistency, even at very low temperatures. It closely resembles potassium, though it is more fusible and volatile and its reactions more vigorous. It is widely distributed in minute quantities, mainly in lepidolite, in which approximately 1 p.c. can be

present. It also occurs in the Stassfurt salt deposits and can be extracted from them while extracting potassium chloride. Its name comes from the deep red colour of its lines in the spectrum. The Germans Bunsen and Kirchhoff discovered it in 1861 by spectroscopic investigation of spring water at Dürkheim, Bavaria.

Rubini, GIOVANNI BATTISTA (1795-1854). Italian singer. Born at Romano, near Bergamo, April 7, 1795, the son of a musician, he sang in public as a boy, and then, beginning as a chorus singer, gradually developed a wonderful tenor voice which earned for him the title



Giovanni Rubini,
Italian singer

of the king of tenors. After achieving fame in Italy, he visited Paris in 1825, and England in 1831, where he frequently appeared in opera and oratorio. In St. Petersburg, in 1843, his singing so charmed the tsar Nicholas I that he was made director of singing. Both Bellini and Donizetti wrote special parts for Rubini in some of their operas. He died at Romano, March 2, 1854.

Rubinstein, ANTON GREGOROVICH (1829-94). Russian pianist and composer. Born at Wechwo-tyetzn, in Besarabia, Nov. 28, 1829, he studied piano-playing in Moscow and Paris, and in 1840 played in Paris before Liszt and Chopin. He studied composition in Berlin, 1844-48, and



Anton Rubinstein,
Russian pianist

settled in St. Petersburg, where he became court pianist, 1858, and director of the imperial conservatoire, which he founded, 1862-67. During 1867-73 he toured widely in Europe and America, and died near St. Petersburg, Nov. 20, 1894. His 18 operas he counted as his most important work, but they are seldom played, though many of his piano compositions, fluent and melodious, such as the famous Melody in F, and a few songs, are well known. He published his memoirs in 1889. *Consult* Rubinstein, a Biographical Sketch, A. MacArthur, 1889.

Rubinstein, ARTHUR (b. 1890). American pianist. Born in Warsaw, then in Russian Poland, Jan.

18, 1890, he studied in Berlin under Leschetizky and Bruch, and gave his first recital at 11. One of the world's most brilliant pianists, he made his American début with the Philadelphia orchestra in 1906, and gave 75 concerts in three months. He first toured S. America in 1918. Returning to Europe in 1927 he lived there ten years, after which he settled in Los Angeles.

Rubric (Lat. *ruber*, red). Term for an ecclesiastical injunction, with special reference to the instructions or rubrics to ministers in the old service books, which were written or printed in red. It is applied to the directions for the order of service in the Book of Common Prayer, now commonly printed in italic type. These rubrics are partly based on pre-Reformation directions contained in the Ordinale, Consuetudinary, and Pica. Many rubrics, some of which have become obsolete through changes in social conditions, were added concerning the parochial duties of the clergy, and there are a few explanations of doctrinal points. While the specific directions of the rubric are authoritative, nothing can be inferred from their silence. Following Roman legal custom, the title of a statute is called the rubric.

Ruby (Lat. *rubeus*, red). Red transparent variety of corundum, Al_2O_3 . To be distinguished from similar stones, e.g. garnet, spinel, etc., by being dichroic by transmitted light, it is inferior only to the diamond in hardness, and has the advantage of appearing equally brilliant in natural or artificial light. The finest rubies possess a deep, clear, carmine colour, and are called pigeon's blood rubies. As a rule the deep red stones are more valuable than the paler varieties, which are comparatively common. The best dark red rubies come from Mandalay in Burma, where the ruby occurs in crystalline limestone in association with spinel and garnet, and from Siam and Ceylon.

Those found in Ceylon are pinker, and those in Siam a deeper red even than pigeon's blood stones. Large rubies are far more uncommon than large diamonds, and are consequently exceedingly valuable. The largest ever found weighed 2,000 carats, but had a number of flaws detracting from its value.

Large rubies have been made artificially by fusing together small stones, and by fusing pure aluminium oxide with a small quantity of chromium oxide. The

former varieties can always be distinguished from the natural stones, but the latter are virtually indistinguishable. A number of so-called rubies are not varieties of corundum. Many are garnets, e.g. Australian rubies and Cape rubies. The Siberian ruby is a tourmaline, and Balas ruby a spinel. *See* Precious Stones.

Ruby Silver. Red silver ore minerals, pyrrargyrite and proustite. The ruby silvers often occur just below the enriched zone in silver deposits associated with other silver-bearing minerals.

Rucker, SIR ARTHUR WILLIAM (1848-1915). British physicist. Born in London, Oct. 23, 1848, he was educated at Clapham and Brasenose College, Oxford, of which he became a fellow. In 1874 he was made professor of physics at the Yorkshire College, Leeds, removing in 1886 to London as professor at the Royal College of Science. From 1901 to 1908 Rucker was principal of London university. In 1902 he was knighted, having been president of the British Association in 1901. He died Nov. 1, 1915.

Rückert, FRIEDRICH (1788-1866). German poet and Orientalist. He was born May 16, 1788, at Schweinfurt, Bavaria, and after studying law was professor of Oriental languages at Erlangen, and at Berlin, during 1826-48. He was acclaimed by contemporaries as the



Friedrich Rückert,
German poet

most original and powerful of German poets, perhaps more because of the scope and the variety of his work than to any inherent quality in most of it. He adapted many Oriental works, especially Persian and Arabic, to German verse-forms, but is best remembered by his lyrics *Liebesfrühling* (The Spring of Love), 1844. His *Ich Liebe Dich* has been set as a song by Grieg; *Barbarossa* is another well-known poem. Died at Neuses, nr. Coburg, Jan. 31, 1866.

Rudagi (d. 954). Persian poet. The date of his birth is unknown, though the place is generally agreed upon as Rudag, in Transoxiana. Rudagi became attached to the court of Samanid Nasr II bin Ahmad, and though he wrote over 1,000,000 verses only fragments have survived. His genius was such that he practically fixed the

forms of Persian verse which still survive. He died in poverty.

Rudd OR **REDEYE** (*Scardinius erythrophthalmus*). Common freshwater fish, found throughout Great



Rudd. Small fresh-water fish, resembling the roach

Britain and Europe. It has red fins and eyes, and closely resembles the roach; but the dorsal fin is placed rather farther back. It seldom exceeds 1½ lb. in weight, and is of small value for the table.

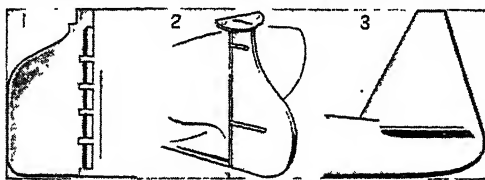
Rudder (A.S. *rōðer*, paddle, from *rōwan*, to row). Device for altering the course of a ship or aircraft. In the earliest ships the rudder was an oar over the stern, with the aid of which the vessel could be rowed on a new course. Later a large oar-blade was fixed to each side of the stern and the ship paddled to a fresh course. In

Greek and Roman galleys, which had prows at both ends, steering blades were fitted fore and aft, so that as the pitching of the ship lifted the afterpair

out of the water, the foremost pair could act. The steering oars passed through a metal ring on the ship's hull and were connected by ropes to a bar helm or tiller. Medieval ships had one steering oar, fixed on the right side; hence the term starboard, or steerboard, for the right side of a ship looking forward. Oar rudders are still normal for rowing boats used in surf or against wind and tide, as such steering devices bring the boat's head round quickly. Helm (A.S. *helf*, a handle) is frequently used as a synonym for rudder, but the helm is actually the handle by which the rudder is moved. Similarly, tiller is not a synonym for rudder, but (derived from an English dialect word meaning spade) has the same meaning as helm. In the 14th century the oar rudder was generally replaced by the flat-framed rudder hinged to the sternpost and operated by a tiller bar passing through the rudder head or by ropes passing over a wheel. With certain mechanical refinements this type of rudder remains basically that used today.

In steamships the rudder may weigh several tons, steam steering gear, controlled by a small wheel on the bridge, operating it. Certain types of steamers, particularly those navigating in confined river waterways, have rudders fore and aft. A pair of vertical rudders, one on either side of the stern, is used on submarines to control course when submerged or on the surface, while hydroplanes, or horizontal rudders, are used for depth and horizontal control when navigating under the surface.

Vertical rudders are used on aircraft for control of lateral direction. They consist of a flap hinged to the stern post, and are operated by wires attached to foot-pedals in the cockpit. In larger aircraft two or more rudders are fitted and are operated by motors actuating connecting rods. A marine rudder acts by offering resistance to the fluid around it, so causing the stern to move away from the surface receiving the extra pressure, and the other end of the craft, the bows, to turn in an opposite direction; i.e. towards the side to



Rudder. Type used by: 1. Merchant-ship. 2. Rowing boat. 3. Aeroplane

which the rudder is swung. With aircraft a similar object is achieved by turning the rudder so that it offers resistance to the slip stream flowing past the fuselage.

Ruddigore, OR **THE WITCH'S CURSE**. Comic opera by Gilbert, with music by Sullivan. First produced at the Savoy Theatre, London, Jan. 22, 1887, it had a run of 283 performances. Later it disappeared from the Gilbert and Sullivan repertory for many years, being revived at the Prince's Theatre, London, Oct. 24, 1921, since when it has been among the most popular of the operas. In Ruddigore the librettist had a greater share than usual, but the song *The Ghosts' High Noon* is an outstanding feature of the musical score.

Ruddle. Red variety of haematite (*q.v.*), known as reddle (*q.v.*).

Rude, **FRANÇOIS** (1784-1855). French sculptor. Born at Dijon, June 4, 1784, the son of a smith, he studied at Dijon, and at the Beaux Arts, Paris. After a period of exile in Brussels, he returned to Paris in



François Rude, French sculptor

1827, and produced a number of works constituting a revolt against the prevailing classicism. His chief achievement was the monumental *La Marseillaise* for the Arc de Triomphe. He died in Paris, Nov. 3, 1855.

Rüdesheim. Town of Hesse, W. Germany, picturesquely situated at the foot of the Niederwald and on the right bank of the Rhine, 16 m. W. of Mainz. Known as a town since 864, it has remnants of 10th and 11th century fortifications. It is celebrated for its wine from the surrounding vineyards. Pop. 6,000. Overrun by the U.S. 7th army in March, 1945, after the Second Great War it came within the U.S. zone of occupation.

Rudini, **ANTONIO STARRABA**, **MARCHESE DI** (1839-1908). Italian statesman. Born at Palermo, April 6, 1839, he conspired as a young man against the Bourbon government, and after Garibaldi had delivered Sicily, 1860, became mayor of Palermo and, in 1868, prefect of Naples. The following year he was minister of the interior for a few months. After some years spent out of office he was summoned to form a government in 1891.

As a result of Adowa, 1896, the Liberals were driven from power, and Rudini formed another Conservative cabinet, which held together till 1898. Rudini never inspired the confidence of his own party nor that of the Liberals, whom, at different times, he tried to placate. He died Aug. 6, 1908.

Rudnik. Ridge of hills in Northern Serbia, Yugoslavia, called also Suvobor. The highest point is 3,835 ft. alt.

Rudok. Town of Tibet. It is situated close to the frontier of Kashmir, and is the caravan centre for the trade by Leh and the Indus valley with N.W. India. It stands at an alt. of 15,000 ft. overlooking the S.E. end of the depression occupied by Lake Pagong.

Rudolf. Lake of Africa. Partly in British East Africa and partly in Abyssinia, it occupies an extension of the Rift Valley and forms the centre of an inland drainage system. Its length is about 185 m., with a maximum width of 37 m., and its alt. 1,240 ft. Lake Rudolf was discovered in 1888 by Count S.

Teleki and Lieut. von Höhnel. *Consull* Discovery of Lakes Rudolf and Stephanie, Count S. Teleki, 1894.

Rudolph I (1218-91). German king and Roman emperor. Born at Limburg, May 1, 1218, he was a son of the count of Hapsburg, and in 1239 became head of the family. Germany was then the scene of endless disturbances due to the quarrel between emperor and pope. Rudolph, however, managed to get possession of the family estates in S.W. Germany, and in 1273 he was chosen German king, his election ending the interregnum that had begun in 1250, and starting a new era. He was crowned at Aix-la-Chapelle, and was recognized by the other princes and by the pope.

By his victory over Ottakar, king of Bohemia, in 1278, Rudolph secured Austria and Carinthia, and in 1282 he gave these over to his sons. He died at Spire, July 15, 1291. Rudolph is famous in history as the real founder of the house of Hapsburg.

Rudolph II (1552-1612). German king and Roman emperor. The eldest son of Maximilian II and Maria, daughter of Charles V, he was born in Vienna, July 18, 1552, and educated in Spain. Made king of Hungary, 1572, and German king and king of Bohemia, 1575, he succeeded his father as emperor, Oct. 12, 1576.

Fanatical, irresolute, and slothful, he reversed his father's policy, persecuted the Protestants, and neglected public affairs for the pursuit of magic and alchemy. The Turks invaded the empire in 1593, and in 1604 Hungary revolted. In April, 1606, Rudolph was declared by the archdukes incapable of ruling. His brother Matthias, who assumed the government, restored order in Hungary, and on June 29, 1608, Rudolph ceded to him all his dominions except Bohemia, Silesia, and Lusatia (Lausitz). In 1609 he was forced to grant religious liberty to the Bohemians in the so-called Letter of Majesty. This, however, did not prevent his deposition from the throne of that country in 1611. Rudolph died unmarried at Prague, Jan. 20, 1612. A man of cultured tastes, the emperor patronised Brahe and Kepler, the latter of whom dedicated to him his Rudolphine Tables. It has, however, been suggested that he was insane.

Rudolph (1858-89). Crown Prince of Austria. Born Aug. 21, 1858, the only son of Francis Joseph, emperor of Austria, he

was educated for the throne and showed considerable ability as a naturalist and a linguist, while his travels led him to write two books: *Fifteen Days on the Danube*, 1881, and *A Journey in the East*, 1884. In 1881 he married Stephanie, daughter of Leopold II,



Rudolph, Crown Prince of Austria

king of the Belgians. On Jan. 30, 1889, Rudolph was found shot at Mayerling, near Vienna. In 1900 his widow married Prince Elemer Lónyay, whose nephew Count Carl Lónyay published Rudolph: the Tragedy at Mayerling, 1950.

Rudolstadt. Town of Thuringia, E. Germany, on the Saale, 18 m. S. of Weimar. The chief buildings are the castle of Heidecksburg, rebuilt after a fire in 1735, and the Ludwigsburg, which housed a natural history collection. The manufactures have included porcelain, pianos, oils, and chemicals. The town was founded in the 7th century by Rudolf, duke of Thuringia, hence its name, and passed to the counts of Orlamünde in the 13th century. In 1340 it passed to the counts, later the princes, of Schwarzburg, one of whom built the castle of Heidecksburg. Pop. (1950) 23,100. In an area seized by U.S. forces during April, 1945, after the Second Great War it came within the Russian zone of occupation.

Rudra. Hindu god. As the god of storms he appears in the Rig-Veda, where he is described as



Ruff. Male bird, showing the shield of feathers on the throat, grown during the breeding season W. S. Berridge, F.Z.S.

shooting fiery darts at the earth. He also had beneficent attributes, with power over cattle, and revealed the uses of certain curative herbs to mankind.

Rudyard. Parish and hamlet of Staffs, England. It is 2 m. S. of Leek, with a rly. station. Here is Rudyard Lake, a sheet of water 2 m. long, which forms a reservoir for the Trent and Mersey canal.

Rue OR **HERB OF GRACE** (*Ruta graveolens*). Perennial sub-shrub of the family Rutaceae. A native of S. Europe, it has alternate, much-divided, bluish-green leaves, the ultimate leaflets being oblong. They are plentifully supplied with oil-glands, from which proceed the powerful odour characteristic of the plant, and the bitter taste. The small yellowish flowers grow in clusters. Rue has long been used in medicine as a stimulant and narcotic.



Rue. Leaves and flowers

Rueda, LOPE DE. Spanish dramatist. See Lope de Rueda.

Ruff. Collar of linen or lace worn in the 16th century, and a characteristic part of Elizabethan dress. Ruffs were starched, stand-



Ruff. Circular ruff of starched lace, as worn in the 16th century Portion of a picture by Franz Hals

ing stiffly away from the neck, and some were wired to keep their folds in place, while costly lace, sometimes of gold and silver, and the finest embroidery, went to make them magnificent. At first the ruff was circular, fastening closely round the neck, but later assumed another form, called a whisk, usually made of wired lace, standing high at the back, and open in front. The circular ruff still forms part of the official dress of many Lutheran clergy.

Ruff (*Machetes pugnax*). Bird of the sandpiper sub-family. The plumage is of mottled brown, grey,

and black, with pale buff underparts, and the length is about 12 ins. In the breeding season the male develops a tuft of long feathers on either side of the head, and a broad ruff or shield of feathers on the throat, whence the name is derived. The female, or reeve, is without these appendages.

These ruffs, which vary greatly in colour, practically all the neutral tints between black and white occurring, are constantly distended and displayed during courting time, when the male performs curious antics to commend himself to the females. The ruff is polygamous. Its nest is made of coarse grass and placed among rushes. The bird was formerly abundant in marshes in many parts of England, but has now been almost exterminated. In winter it migrates from N. Europe and Asia to the Mediterranean, Africa, and India.

Ruffe OR **POPE** (*Acerina cernua*). Fresh-water fish. It is very much like a perch, to which it is closely



Ruffe. Small fresh-water fish found in England and Central Europe
W. S. Berridge, F.Z.S.

allied, but lacks the vertical stripes of that fish, and has spots on the dorsal fin, and seldom exceeds five ins. in length. It is found in clear running streams throughout southern and middle England and Central Europe, and feeds upon worms and insects.

Rufford Abbey. Former seat of Lord Savile in Notts, England. It is 2 m. S. of Ollerton in what was formerly Sherwood Forest, and the estate extends along the banks of Rainworth Water. The existing house, built of red sandstone in the Elizabethan and Jacobean styles, incorporates some remains of the abbey and the residence which took its place. Valuable pictures and tapestry were collected. Here in 1148 an abbey for Cistercian monks was founded by the earl of Lincoln. After the dissolution of the monasteries this passed to the Talbots and then to the Saviles, and the abbey was converted into a residence in 1648. It was the home of the great marquess of Halifax, passing on the death of his son in 1700 to

another branch of the family. In 1784 it came to the Lumleys, afterwards earls of Scarbrough, and was left by the 8th earl in 1856 to his natural son John (1818-96), who was made Baron Savile.

Ruff's Guide to the Turf. Annual publication for students of racing. It was founded in 1842 by William Ruff (1801-56), and was annually revised by him until 1854. It contains a complete record of flat racing and steeplechasing in Great Britain and Ireland for the year, as well as entries for the principal races for the coming year, racing statistics, bloodstock sales, and the official rules governing racing and betting.

Rufiji OR **LUFIJI.** River of Tanganyika Territory, E. Africa. Rising N.E. of Lake Nyasa, it flows N.E. to its junction with the Rwaha just above Pangani Falls. From this point the direction is E. to the coast opposite the island of Mafia. The river is navigable in parts, and with its affluents forms the principal drainage system of the central and S. portions of the territory. Here in 1915 the German cruiser Königsberg was destroyed by a British naval detachment.

Rufinus (d. A.D. 395). Chief minister of the emperors Theodosius and Arcadius. A Gaul by birth, he entered the service of Theodosius and received the command of the East. After the emperor's death he was appointed guardian of the young Arcadius, but his harshness made him universally hated. He was assassinated by an agent of Stilicho (q.v.).

Rufinus, **TYRANNIUS** (c. 360-410). Italian theologian. Born probably in Venetia, he studied theology for a time with S. Jerome and at Alexandria, and was involved in the persecution of the Catholics by the Aryans. He became a presbyter in 394, having previously founded a monastery on the Mount of Olives, quarrelled with S. Jerome over the Origen controversy, and settled in Rome, 397, and later in Sicily. His translation of such Greek theologians as Origen, Pamphilus, and Gregory



Rufus Stone,
New Forest

of Nazianzus were widely known in the early Church.

Rufus Stone. Rough monument which marks the spot where William Rufus, king of England, was killed by an arrow while hunting in the New Forest, Aug. 2, 1100. It is near Stony Cross, just N. of the

road from Cadnam to Ringwood.

Rug. Term now applied to a piece of heavy woollen cloth, often of many colours, used as a travelling wrap; also a small carpet. In the 16th and 17th centuries rug was the name of a coarse woollen frieze, and also of a garment made of such material. See Carpet.

Rugby. Borough and market town of Warwickshire, England. It stands on the river Avon, 30 m. by rly. S.W. of Birmingham. It is connected with Birmingham and London by canal. The buildings include the modern churches of S. Andrew and Holy Trinity, also the R.C. church of S. Marie by the elder Pugin. With a famous school (v.i.), Rugby is a railway junction and a hunting centre. Here is the post office radio telegraphy transmitter. The manufactures include electrical appliances, while cattle, horse, and sheep fairs are held. It gives its name to a co. constituency. Market day, Mon. (cattle) and Sat. Pop. 45,000.

From the town was derived the title of Baron Rugby, taken in 1947 by Sir John Loader Maffey (b. July 1, 1877) who was educated at the school and became a governor. He was governor-general of the Sudan, 1925-33, and U.K. representative in Eire 1939-49.

Rugby School. English public school. It was founded in 1567 by Lawrence Sheriff, a native of Rugby and a courtier, also a member of the Grocers' Company.



Rugby town arms



Rugby, Warwickshire. Hospital of St. Cross

Rugby school has property around Rugby and in London, and is managed by a governing body of 14. The first building was near the parish church and the school was removed to its present site about 1750. In 1809 the present buildings were begun, and many additions have since been made. The number of boys is about 640, accommodated in 10 houses. The school is divided into lower middles, upper middles, and upper school. The upper school has three sides, classical, modern, and science. There are scholarships to the school and from it to the universities. Buildings include chapel, library, observatory, reading-room, museum, laboratories, and gymnasium. There are extensive playing fields.

Rugby became a great public school mainly under the direction of Thomas Arnold (*q.v.*), headmaster, 1828-42. Tait, Temple, and Percival were other famous headmasters. It gained fame with the popularity of Tom Brown's Schooldays, and from the fact that it was the first home of Rugby football. In the First Great War 682 Rugbeians lost their lives; 352 in the Second Great War.

Rugby Football. This game is described under Football.

Rugby League. For the history of this association, see Football.

Rugby Union. For the history of this association, see Football.

Ruge, ARNOLD (1802-80). German reformer. Born on the island of Rügen, Sept. 13, 1802, he studied at Jena and Halle, taking an active part in the student societies at both places, which cost him six years' imprisonment in a fortress. At Halle, where he obtained a professorship, he founded the important critical journal *Hallesche Jahrbücher für Deutsche Kunst und Wissenschaft*, afterwards renamed *Deutsche Jahrbücher*; then removed to Dresden. In 1848 he took part in the attempted revolution, published for a brief period a revolutionary paper, *Reform*, in Berlin, and was obliged to flee to England, where he met Mazzini. He died at Brighton, Dec. 31, 1880.



Arnold Ruge,
German democrat



Rugby School. The old quadrangle

Rugeley. Urban dist. and market town of Staffs, England, 7 m. N.W. of Lichfield, near the Trent and Mersey canal. The church, dedicated to S. Augustine, is a 19th century building. There is a 17th century grammar school. The principal industry is coal mining and others include tanning and clothing and boot and shoe manufactures. Pop. 8,500.

Rügen. Largest German island, in the Baltic Sea. It is separated from Pomerania by the mile-wide strait of Stralsund, and is 33 m. by 26 m., with an area of 373 sq. m. Steep chalk cliffs reach an alt. of over 500 ft. near the E. coast. The coastline is very irregular. Grain, fish, and cattle are the chief products. Bergen is the chief town. The island, which takes its name from a German tribe, the Rūgi, was Danish from 1168, Pomeranian from 1325, Swedish from 1648, and Prussian from 1815. Units of the 2nd White Russian Army captured the island on May 6, 1945, occupying Sassnitz, the terminus of the train ferries to Sweden. After the war Rügen was in the Russian zone of occupation. Pop. 54,000.

Ruggiero, GUIDO DE (1888-1948). Italian historian and philosopher. Born in Naples, he was professor of philosophy at Messina university, 1923-25, then at Rome university until 1927, when he was dismissed for his refusal to take an oath of allegiance to the fascists. Following the liberation of Rome in 1944 he became rector of Rome university. His *History of European Liberalism* appeared in 1925, but his great *History of Philosophy* (17 vols.) was still uncompleted at his death. Dec. 30, 1948.

Ruhleben. Racecourse near Berlin. During the First Great War it was converted into a huge internment camp for civilian prisoners, who included many British merchant seamen.

Ruhmkorff, HEINRICH DANIEL (1803-77). German electrician. He was born at Hanover, Jan. 15, 1803. At the age of 22 he went to

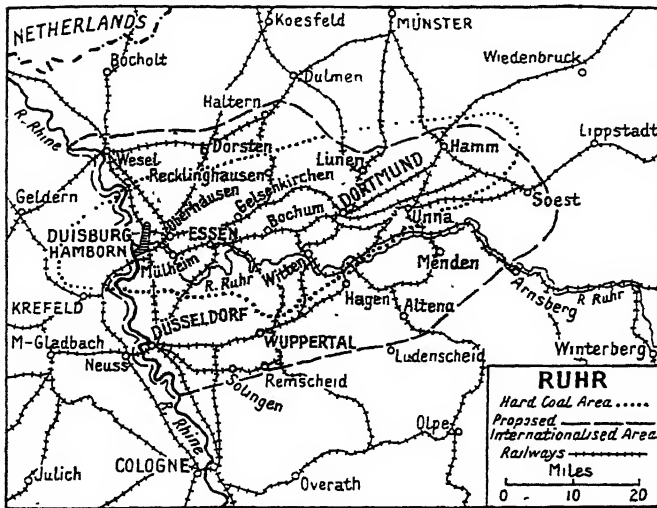
Paris, where he carried out extensive experiments with induction coils, eventually perfecting one with a very long secondary coil, containing 6 miles of fine wire, insulated with silk and shellac. This became known as the Ruhmkorff coil. Its inventor died Dec. 20, 1877. See Induction Coil.

Ruhnken, DAVID (1723-98). German scholar. Born at Stolp, Pomerania, Jan. 2, 1723, he was educated at Wittenberg, and went in 1743 to Leyden, where in 1757 he became lecturer in Greek. Chosen a professor in 1761, he did not receive the chair, but in 1774 he was elected university librarian. He died May 14, 1798. Ruhnken, who edited Plato, Homer, and Xenophon, was one of the scholars who helped to restore Greek to a high place in secular studies.

Ruhr. River of Germany. Not to be confused with the Roer (*q.v.*), the Ruhr rises in the Winterberg and flows for 145 m. in a W. direction to join the Rhine at Duisburg-Hamborn. The last 46 m. are canalised, with 10 locks. The Ruhr traverses a rich iron and coal field, and gives its name to the Ruhr basin (Ger. *Ruhrgebiet*, Ruhr district), the most important district in Europe specialising in heavy industry, and covering an area of about 1,800 sq. m., with a pop. (1939) of some 4½ millions. Before 1939 the Ruhr area produced 75 p.c. of Germany's coal, 85 p.c. of her iron, and 80 p.c. of her steel.

The three principal industrial towns of the area are Essen, Dortmund, and Bochum (*qq.v.*), and here were centred, from before the First Great War, Germany's principal armament industries. By the treaty of Versailles, Germany undertook to disarm, and the war industries in the Ruhr were converted to peaceful objects. France, however, continued to fear this source of war strength in the German economy. In an unsuccessful attempt to force Germany to pay reparations, French and Belgian troops occupied the Ruhr, 1923-25, when the Dawes plan (*q.v.*) was accepted. After Hitler came to power in 1933, with the connivance of the industrialists of the area he secretly built up the war potential of the Ruhr again.

During the Second Great War, the Ruhr was a constant object of attack for the R.A.F. (which bombed Essen for the first time Aug. 29, 1940) and later for the U.S.A.A.F. From mid-Feb., 1945, Allied strategic air attack was concentrated on isolating the Ruhr. The R.A.F. destroyed the



Ruhr. Map showing the Ruhr river; the Ruhr hard coal mining area; and the area the French wished to be under international control

two rly. viaducts at Bielefeld on March 14, the Arnsberg viaduct on the 19th, and rendered the Vlotho bridge impassable, effectively cutting the three main rly. routes to the E. .

After the Allied crossing of the Rhine (*q.v.*) on March 24, the German high command decided to hold the Ruhr. Encirclement of the area, which became one of the first objects of Allied strategy, was effected April 1, the U.S. 9th army from the N. and the U.S. 1st army from the S. meeting near Lippstadt. In the pocket were one whole German army group and two corps of another. F.M. Model, who was in command, made abortive attempts to fight his way out from Hamm and from Siegen. The ammunition factories were forced to cease production; and on April 14 the pocket was split at Hagen. The E. part collapsed on the 16th, the W. on the 18th, by which time the front was 100 m. farther E. Prisoners numbered 325,000, including 30 generals.

The Ruhr lay in the British zone of occupation after the surrender of Germany in May, 1945. A proportion of such machinery as survived was dismantled and distributed among the Allies as reparations; and the problem of housing the large pop. and keeping it fed and occupied was one of the gravest of the British zone. Joint British-U.S. control of the coal mines replaced British control in Nov., 1947, when responsibility for production and distribution was transferred to the Germans. Production of coal at the end of 1948 had risen to

eight million tons a month, compared with 10 million in 1938.

France, who wanted the Ruhr detached from Germany and placed under international administration, objected strongly to the restoration of responsibility to the Germans. But differences between her and the other Western Allies as to the future of the Ruhr were resolved in an agreement of Dec. 28, 1948, to set up an international authority to supervise production and distribution of coal, coke, and steel from the area. The Benelux countries had one vote each, France, the U.K., the U.S.A., and Germany three votes each on this body, eight favourable votes carrying a decision. It met for the first time in London, 1949. From Dec. Germany had its own federal govt. representatives. *See* Krupp.

Ruhrort. Former German town merged in 1929 in Duisburg-Hamborn (*q.v.*).

Ruislip. Residential district of Middlesex, England. It lies between Harrow and Uxbridge, and is well served by rly. Its history goes back to the time of Edward the Confessor. The ancient flint and stone church of S. Martin, restored in 1869-72 by Sir Gilbert Scott, has a tower with a peal of eight bells; Nelson's daughter lies buried in the churchyard. To the N. runs the brook Pin, and near is an expanse of woodland, Ruislip Common stretching towards Northwood; and Ruislip Lido on the banks of Ruislip reservoir, 80 acres, formed to supply the Grand Union Canal. Ruislip now forms

part of the Ruislip-Northwood urban dist. and bor. constituency Pop. 65,710. *Pron.* Rye-slip

Ruiz, JUAN (c. 1283-c. 1350). Spanish poet. Born at Alcalá de Henares, he was ordained, and in spite of his irregular life became arch-priest of Hita or Fita, Guadalajara. The last 13 years of his life appear to have been spent in prison, where in 1343 he wrote a poem known as *El Libro de Buen Amor* (the book of good love), or *El Libro de los Cantares* (the book of songs). A miscellany, mainly erotic, and masterly in metrical technique, it is full of vigorous satire and realistic character-drawing, recalling the work of Chaucer.

Rukwa, RUKWA, OR LEOPOLD. Lake of Africa. In the Langenburg district of Tanganyika Territory, it lies N.W. of Lake Nyasa, near the border of N. Rhodesia, about 2,500 ft. above sea level.

Rule (Lat. *regula*). Principle, formula, or order of any kind. The word has come to be used for regulations of minor importance, not sufficiently serious to be known as laws. Thus a society or school has its rules. The word is also used for the regulations of monastic orders, e.g. the rule of S. Benedict; and for something which is generally done, an established custom being the rule. In printing, a rule is a strip of rolled brass or lead alloy, employed to form an edge or border to a page, or to make the punctuation mark colloquially called a dash. (*See* Monasticism; Printing.)

In English law rules of court are rules governing the procedure in all branches of the supreme court. They prescribe for all the steps necessary to be taken in every kind of action, except probate, divorce, and admiralty suits, and bankruptcy matters, all of which are governed by rules of their own. They tell the litigant how and in what form he must issue his writ or summons; how to serve it; what pleadings (*q.v.*) are to be delivered, what they must and must not contain; how to obtain discovery of documents, and how proceedings are to be taken, and within what time.

Rule OR REGULUS. Legendary saint in Scotland. Bishop of Patras, in Greece, where S. Andrew was martyred, whose relics he is said to have brought to Scotland, where he met a Pictish king, Angus McFergus, and with him dedicated Muckross, now St. Andrews, to the saint. S. Rule's Tower is a prominent erection in

that city. The king reigned either 731-61 or 822-34. Rule has been confused with another S. Regulus or Rieul, a Greek who, according to the Bollandists, became first bishop of Senlis in the 4th century.

Rule, Britannia. British national song. Written by James Thomson, and composed by Arne, it was a number—six stanzas for tenor solo and choral refrain—in a masque, *Alfred*, produced Aug. 1, 1740, for Frederick, prince of Wales, as part of an entertainment given at Cliefden (later Cliveden) House, nr. Maidenhead, to commemorate the accession of the house of Hanover, and to celebrate the third birthday of the prince's daughter Augusta. The song immediately attained great popularity, and it eventually became almost a second national anthem.

Rule of Faith (Lat. *regula fidei*). In theology, the source or sources accepted by a church as authoritatively determining its doctrines. To the R.C. church the rule of faith is given by Scripture, the tradition of the church, and the fathers. To most Protestant churches it is Scripture alone.

Rule of Law. Constitutional principle that the executive has no arbitrary power over the individual and that the executive may be called on to justify all its actions towards an individual before the ordinary courts of law. The principle is of very great legal importance in the U.K.

Rule of the Road. Regulation enforceable by law to ensure safety in the use of thoroughfares by vehicles and riders. In the U.K. the rule of the road, unlike that prevailing in most Continental countries and America, is to keep to the left, and to pass in that position all traffic coming in an opposite direction; but on overtaking any vehicle, to draw towards the centre of the road, and pass on the right side of the vehicle overtaken. Such rules do not apply to one-way streets, where traffic may use both sides of the road. Traffic about to enter or cross a main road from a side road must halt before crossing or turning. At roundabouts in Great Britain traffic moves in a clockwise direction; where the rule of the road is to keep right it is anti-clockwise. (See Highway Code.)

At sea the rule of the road is a convention for the guidance of a ship when meeting another. Port means the left-hand side of a ship, and starboard the right. The rule of the road is for ships to pass port

to port. At night a green light is shown on the starboard, and a red light on the port. Steamers give way to sailing ships.

Aircraft observe a similar rule of the road when flying at the same alt. On busy routes, the air is divided into alt. zones or corridors, to one of which aircraft flying in a particular direction must keep.

Rum. Alcoholic spirit distilled from fermented cane sugar. It is made in the W. Indies. Its brown colour is imparted by caramel, by storing in sherry casks, or by both. High quality rum is made from mashes containing some scum, but cheaper varieties come from skimmings and the waste products of cane sugar factories. Like wine, rum depends largely

on soil and climate, its essential qualities being due to the presence of esters. Rum is usually distilled at some 40 p.c. overproof, though it varies between 30 and 66 p.c. overproof. Occasionally guavas or pineapples are thrown in the still, to flavour the rum, or sliced fruit is added to the spirit, to give it a distinctive flavour. Much rum which finds its way to the market is artificial, made from beet or "silent" spirit, flavoured with rum essence. See Alcohol; Distilling; Proof Spirit.

Rum. Island of the Inner Hebrides, Inverness-shire, Scotland. It is 15 m. N. of Ardnamurchan Point, is 8 m. long and $7\frac{1}{2}$ wide; area, 42 sq. m. Important geologically, it had an active volcano in Tertiary times. Pop. 250.

RUMANIA: A COUNTRY OF THE BALKANS

Edgar Stern-Rubarth, Ph.D.

This general sketch of the physical features and history of Rumania is supplemented by articles on the towns and areas of the country, e.g. Bukarest; Constantia; Dobruja; Moldavia; Transylvania. See also Balkan Wars; Bessarabia; Russo-German Campaigns, etc.

Rumania (sometimes spelled Romania or Roumania) took its name from the fact that it was,

during c. A.D. 101-275, a part of the Roman empire. As Dacia (q.v.), a name taken from that of the Daci, its chief tribe, it was conquered by Trajan, whose

memorial column in Rome gives valuable pictorial information about the Dacian people. Dacia was rapidly latinised and developed a language which, alone in E. Europe, is based upon Latin. Though infiltrated by Goths, Bulgars, Huns, Avars, later Turks, this mixed people developed into a distinct ethnic type of tall alpine-dacianer shortheads, numbering within Rumania slightly more than 13 millions; the rest of the pop. of Rumania is made up of people of Magyar, German, Jewish, Ukrainian, Turkish, Gypsy, etc., origins.

In the form in which it emerged from the Second Great War Rumania comprised the former principalities Moldavia and Wallachia, and Transylvania. The changes in Rumania's size and pop. during the 20th century are shown in the table.

	Area	Population
1914	50,710 sq. m.	7,650,000
1939	113,884 " "	19,933,802
1940	94,532 " "	16,318,869
1941	75,866 " "	13,551,756
1947	88,715 " "	16,400,000



Rumanian arms

The country's spine is the great arc of the Carpathian mts., embracing the plateau of Transylvania (the former Siebenbürgen), which itself is a hilly country lying at an elevation of between 1,000 and 2,600 ft. The Carpathians reach 8,480 ft. in the S. (Mt. Negoi), 7,690 in the N. (Mt. Pietros). N. and W. of Transylvania's hills and S. of the Carpathian mts., Rumania is a country of fertile plains whose greatest width is about 50 m., bordered on the S. by the river Danube, which forms most of Rumania's frontier with Bulgaria. The country is watered by a number of tributaries of the Danube, one of which, the Prut, became the



Rumanian Flag.
Blue, yellow,
and red

boundary with the U.S.S.R. in 1940. Rumania possesses one of Europe's richest wheat and maize-growing soils, and produces petroleum, natural gas, salt, iron, gold, silver, and other minerals. Its wooded mountains produce great quantities of timber, mostly floated down the rivers, and there are large lignite deposits. The majority of the people are engaged in agriculture and forestry; there is an important fishing industry, most of it state-controlled, and a number of vineyards. The climate is central European, protected

from Mediterranean influence by the Balkan ranges, but open to influence from the E. At the mouth of the Danube, *e.g.* temps. vary from 30° F. in winter to 110° F. in summer; at Bukarest the mean range is from 26° F. in Jan. to 73° F. in July. Rainfall varies from 15 ins. in the mts. to 30 ins. in the S.E. part of the plains. The lower Danube is frozen during about 40 days of the year; snow covers the valleys for an average of 65 days, the mountains, according to their height, much longer. Drought, up to a hundred days, occurs occasionally in the steppes near the Black Sea.

FLORA AND FAUNA. The forests of Rumania were, before the Second Great War, estimated at between 15 and 17 million acres, 38 p.c. consisting of beech, 25 p.c. of conifers, 24 p.c. of oak, the rest being birch, elm, lime trees, etc. Some Mediterranean plants, *e.g.* acanthus, manna-ash, thrive in the S. plains. The fauna is rich: in the Carpathians chamois, bear, eagle, elsewhere wolf, fox, lynx, wildcat, marten, badger, boar, and stag. Bustard and ground-squirrel live on the steppes; heron, crane, and many other birds and a great variety of fresh-water fish, such as carp, sheat-fish, and sturgeon (producing the famous Orsova caviar) in the Danube delta.

POPULATION. Rather more than a fifth of the people live in towns, of which, however, only 14 exceed 50,000. The most important are:

Bukarest (1945)	..	984,619
Cluj	"	110,956
Jassy	"	108,987
Timisoara	"	108,269
Ploesti	"	105,114
Braila	"	97,293
Galati	"	93,229

Among the non-Rumanian elements in the country, the Germans number some 750,000; the so-called Siebenburgen "Saxons" have occupied for many centuries the heart of Transylvania, the "Suabians," the Banat (split 1919 between Rumania and Yugoslavia). Up to the Second Great War, about 1.5 million Magyars lived in Rumania, mostly in the E. of Transylvania and along the Hungarian border; their number was considerably reduced during and after that war, as was that of the Jews, only a few thousands of the pre-war 850,000 remaining. Census figures for 1935 gave the religious composition of the people as 70 p.c. Orthodox, 10 p.c. Greek

Catholic, 8 p.c. R.C., 7.2 p.c. Reformists and Lutherans, 3.3 p.c. Jews, 0.5 p.c. Unitarians, 0.3 p.c. Mahomedans, 0.7 p.c. unclassified.

Of Rumania's total area, 43 p.c. is under the plough, 24 p.c. forest, 14 p.c. meadow and pasture, 2 p.c. vineyards and fruit-gardens; about 17 p.c. is unused. Drastic agrarian reform in 1921 left barely 12 p.c. of the soil in the hands of the Bojars, large estate owners, while 88 p.c. passed, in comparatively small lots, to the peasants who worked it. After 1944, even the remnants of a former feudal system were eliminated. In normal years maize and wheat each yield between 3.5 and 4.5 million tons a year; barley, 1.5 to 2.4 million

in 1935. There are 2,000 m. of pipe-line in Rumania. Next in order of value were exports of grain products, about £18 million in 1930, with a subsequent drop. Before the Second Great War the U.K. was Rumania's best customer, and biggest supplier, chiefly of machinery and textiles.

INDUSTRIES AND TRANSPORT. Rumania's industries include the production of chemicals based upon petroleum and lignite or coal, leather and textile goods, wood working, especially the manufacture of cheap furniture, metal working, machinery making, and food preserving; some of them, especially mining, are backward in development. Embroidery and



Rumania. Map of the Balkan country showing boundaries under the 1947 treaty

tons; oats, about 1.1 million tons. All these yields fell heavily during the war years.

In 1930 Rumania produced more than 2 million tons of lignite, 300,000 tons of coal; both fell by about 25 p.c. during the war years. Production of petroleum was: 1930, 5.8 million tons; 1932, 7.3 million tons; 1943, 5.3 million tons; 1944, 3.5 million tons; 1945, 4.6 million tons. The consumption of natural gas went up from 1,206 million cub. metres in 1930 to about 2,000 million in 1945, and its possibilities were by no means then fully exploited. Foreign capital was chiefly responsible for the exploitation of Rumania's oil before the Second Great War. It was the principal export and accounted for roughly one-half the value of its foreign trade in 1930, when oil, oil products, etc., were exported to a total of £30 million; export value was about half that

other luxury goods were formerly exported.

The chief means of transport is the Danube and its tributaries; the river port of Galati is the main shipping place for timber, that of Braila for grain, while the Black Sea port of Constanta handles in particular petroleum and its products. The state rlys. were 5,962 m. long in 1945. The Rumanian Airways Co., incorporated in 1945 in a Russian-Rumanian co., flew nearly half a million miles in 1944 and carried more than 12,000 passengers. Air services exist between Bukarest and Belgrade, Warsaw, and Istanbul.

EDUCATION. Rumania had some 11,800 primary and nearly 1,000 secondary schools in 1945. Education is by law free and compulsory, but there was nevertheless a good deal of illiteracy still in the remoter parts of Wallachia and Moldavia. Practical farming

took a high place in the curriculum everywhere. Minorities had to fight hard for cultural autonomy and, if successful, to bear its costs.

There are four universities: Jassy, founded 1860, Bukarest, 1864, Cluj, 1872, and Timisoara, 1945, the last founded after the transfer of Cernauti to Russia in 1940. These universities have together about 3,000 professors and lecturers, and 30,000 students. Rumania's press before the Second Great War comprised about 1,200 publications, more than 100 of them dailies, and most of them published in the capital. Their number was heavily curtailed, however, during and after the war. There were five or six German and as many Magyar dailies, and a number of German and Magyar periodicals of some importance.

LITERATURE AND ART. The oldest existing documents in Rumanian belong to the 15th century: up to that time ecclesiastical Slavonic had been used, but then, under the influence of Hussite, Lutheran, and Calvinist teachers, religious writings were translated into what became the Rumanian language, though for another three to four centuries it was written and printed in the Cyrillic alphabet. During the 17th century, the Bible was translated into Rumanian, and historians, e.g. Demeter Cantemir (1673-1723), used it for works of international importance. A period of Greek influence under the Phanariots followed, until, towards the end of the 18th century, the national spirit asserted itself, proud of the Roman period of their country, writers joined in promoting the latinisation of their language, which, however, retained many Slavonic elements. George Sincai (1753-1816), Peter Maior (d. 1821), George Lazar (1779-1823), Heliade Radulescu (1802-72), paved the way for the literary awakening of the 19th century.

Gregor Alexandrescu (1821-90), Demeter Bolintineanu (1819-72), and the literary circle of the "Junimea," which included Rumania's leading poet Mihail Eminescu (1849-89), Anghel (1877-1917), Sadoveanu (b. 1880), Zamfirescu (1859-1922), Bibescu (b. 1878), N. Jorga (b. 1871), and others gave Rumania a place in world literature. With but 23 Latin letters, printed and written, Rumanian has numerous diacritical marks; the language preserves some few antique remnants, and many traces of the non-Romance languages of the Balkans, and has

borrowed many words, e.g. from Italian and French. There are four distinct spoken dialects, one of which is used in N. Greece.

Traditional crafts play a considerable part in the life of the Rumanian people. The peasants have preserved their old way of dressing in narrow white trousers, belted white shirt, and, according to season, either a sort of wide waistcoat or a sheepskin jacket; their womenfolk wear richly ornamented and embroidered garb.



Rumania. 1. Peasant woman of Kalotaszeg, Transylvania, with her wooden jugs. 2. Girl of the Eastern Carpathians wearing a linen dress and leather waistcoat. 3. A cattle-breeder in his sheepskin coat

Usually in red, black, and yellow, these embroideries are often of high artistic value and enjoy an international reputation. Similar good taste is shown in Rumanian hand-made carpets and rugs, influenced by, but not copied from, oriental designs; wood-carving and pottery are also good. Rumanian musicians range from born Gypsy artists to highly trained pianists and violinists. Though the mass of the people live on cooked maize (*mamaliga*) and drink a weak plum-brandy (*tuica*), the Rumanian cook vies with the best of France or Vienna. Folk-dancing

and popular songs accompany all official and local functions; the *hora*, Rumania's national group dance, is everywhere popular.

HISTORY. The Dacian tribe, a branch of the Thracians, first appear in history under the name of Geti (Getae) fighting under Darius I against the Scythians; as Daci under Philip V of Macedonia they fought the Romans and, from about 200 B.C., remained a power under their own kings until the Roman emperor Trajan, in two campaigns between A.D. 101 and 107, defeated and subjected them to the Roman rule. The prov. of Dacia, as it was called, was settled by a large colony of political and criminal exiles (Ovid, at Tomi, now Constanta, A.D. 8-18, was one of the earliest Roman exiles). Between 258 and 275 Dacia fell to Teutonic assailants. They held it, as the kingdom of the Gepidae, until they in turn were vanquished, 567, by Turkish nomads—the Avars, 6th to 8th centuries, the Petshegs, 10th to 11th, the Cumani 12th to 13th. With the Turks, Slavonic tribes penetrated into the fertile country; yet the remnants of a Roman civilization and language remained.

Of their territorial lords, the Voivods, Prince Besarab created Wallachia about 1330, and Prince Bogdan Moldavia, about 1350. Wallachia came under Turkish suzerainty in 1460, Moldavia in 1511, having previously enjoyed Hungarian and Polish protection. Under Prince Michael the Brave (1593-1601) both these territories were united for a short period with his conquest Transylvania, and the Turks were expelled: this was the first time that the area now Rumania became a sovereign, political unit. Other Bojar dynasties, e.g. the Cantemir and the Ghika, were subsequently installed as rulers tributary to the sultans; from 1716 Phanariots, descendants of the Byzantine nobility who had accepted the Turkish rule in Constantinople, succeeded them, exploiting the principalities in their own and the Turkish interest.

Russia's expansion in the 18th century and her success in several wars with Turkey changed the situation. The peace of Kuchuk-Kainarji, 1774, stipulated that the administration of Wallachia and Moldavia should be improved; the Peace of Adrianople, 1829, replaced Turkish by Russian suzerainty. This lasted until 1856 when, after Russia's defeat in the Crimean war, a plebiscite of the

people was held to decide their future government. The *divans* (popular assemblies), formed in both principalities, favoured their union under a hereditary monarchy. Although the great powers on Aug. 19, 1859, at Paris decided to keep them separate, the two principalities nevertheless elected as their common ruler Prince Alexander Couza and, Dec. 9, 1861, were united under this ruler. Couza tried to enforce by a *coup d'état* reforms, among them one abolishing the serfdom of the peasants. The Bojars, fearing impoverishment, plotted with officers of the army and overthrew him, Feb. 23, 1866.

Rumania Becomes a Kingdom

In his place Prince Carol of Hohenzollern-Sigmaringen—of the R.C. branch of the Prussian dynasty—was elected by plebiscite April 20, and he in turn enforced a new, liberal constitution, July 12, 1866. He established the new state as the principality of Rumania, ruling it alternately with a Conservative government under Bojar premiership, such as that of Catargiu, or a National Liberal one, headed by a member of the Bratianu (*q.v.*) family. During the Russo-Turkish war, 1877-1878, he ceased to pay tribute to Turkey, and lent military aid to the Russians in their dramatic fight at Plevna (*q.v.*). At the Berlin congress of 1878, Rumania secured full independence and, while forced to yield Bessarabia to Russia, gained N. Dobruja, thus securing a link between the Black Sea and its Danubian water system.

A parliamentary decision of March 26, 1881, elevated the principality to the rank of a kingdom; four years later the church of Rumania was proclaimed a separate national church. Relations with Russia deteriorated, and Rumania pursued a policy of "rapprochement" with Austria-Hungary and Germany, with whom special treaties were signed in 1883. The Junimea movement gained political as well as literary ascendancy, its leaders, Carp and Mairoescu making a chief point of agrarian reform. The Liberals, against their leader Demeter Sturdza, took a similar line when peasant revolts in 1907 proved that the liberation of the peasants enforced by Prince Couza was insufficient. Ion Bratianu, prime minister from 1909 with brief intervals until his death in 1927, played safe during the Balkan Wars (*q.v.*) first by staying neutral

and, after Turkey's defeat, by joining the other Balkan states against Bulgaria; the attack from behind by the Rumanians forced Bulgaria to sign the Bukarest peace, Aug. 10, 1913, yielding the southern Dobruja also to Rumania. This comparatively easy success, and a rankling dispute with Hungary over her allegedly bad treatment of the numerous Rumanians in Transylvania, estranged Bukarest from Vienna and Berlin; when the First Great War broke out, popular opinion, fostered by propaganda from both sides, anticipated that the country would join the Entente. King Carol resisted that trend and decided on neutrality, Aug. 3, 1914. He died on Oct. 10 and his nephew Ferdinand, a weaker man influenced by his British wife and by Bratianu, gave in when the Russian armies seemed to be successful against his great northern neighbour, declaring war on Austria-Hungary Aug. 27, 1916, and promptly receiving a German declaration of war in turn, followed by a lightning attack, from Transylvania, by German-Austro-Hungarian armies under the command of Gen. von Falkenhayn, and from Bulgaria, by F.-M. von Mackensen.

German Occupation, 1917-18

By Jan., 1917, nearly the whole of Rumania had been overrun. The Bolshevik revolution in Russia deprived the Rumanian forces of Russian backing. Bratianu had to resign, and Rumania was forced to sign the peace of Bukarest under which, while regaining Bessarabia from Russia, Rumania lost the Dobruja, yielded frontier positions in the Carpathians to Hungary, and was to remain under German-Austro-Hungarian occupation for many years. The defeat of the central powers, six months later, saved Rumania from the fulfilment of these terms; provisional regional governments formed in the wake of the retreating forces of the central powers in the Bukovina and in Transylvania proclaimed their union with Bukarest, and the Rumanian forces advanced to the river Tisza (Theiss), and occupied Budapest Aug. 4-Nov. 13, 1919. They retreated, under Allied pressure, after a good deal of looting. Though a conflict over the Banat brought but partial satisfaction, Rumania secured by the treaties of St. Germain and Trianon (*q.v.*) the Bukovina, Transylvania, and the eastern Banat, in the treaty of Neuilly the whole Dobruja with the consent of the western Allies,

but without that of Russia. Rumania also occupied Bessarabia and thus more than doubled its pre-war territory and pop. King Ferdinand had himself crowned king, Oct. 15, 1922, at Alba Julia (Ger. Karlsburg) in Transylvania.

Rise of the Peasant Party

Under the new premier, Gen. Averescu, leader of the Populist party, Rumania in March, 1921, concluded an alliance with Poland against Russia, and in April signed the pact of the Little Entente (*q.v.*) with Czechoslovakia and Yugoslavia. Fundamental agrarian reform was carried through, large estates being confiscated and their lands distributed to the peasants and smallholders. State control over the petroleum wells was extended, and a new constitution, based upon direct and equal electoral rights and the secret ballot, was adopted March 28, 1923. Ion Bratianu was again prime minister, an office he continued to hold with nearly dictatorial powers until 1927. Growing dissatisfaction, not only among the minorities, still strong in the new parts of the kingdom, but also of the peasantry, and a critical attitude to the crown prince's private life (see Lupescu, Magda), led to a rapid growth in strength of the National Peasant (Zarani) party under Dr. Julius Maniu.

The resignation of the succession by Crown Prince Carol, 1926, the death of Ferdinand, July 20, 1927, of Bratianu, Nov. 24, followed by that of his brother Vintila, and the defeat of the Liberal government, Nov., 1928, by the Peasant party, ended a regime that, with some outward variations, had existed nearly as long as the state of Rumania. A regency council of three acted for Carol's six-year-old son Michael, while Maniu became prime minister and tried to cope with the political and economic difficulties that beset the country. He helped to bring Carol to the throne, June 8, 1930; but Carol was soon in conflict with him and, after his resignation, appointed Jorga, leader of the small National Democratic party, as head of the government. The world economic crisis hit Rumania hard, and Jorga was replaced Oct., 1932, by Maniu who was followed Jan., 1933, by his deputy Vajda-Voevod. A non-aggression pact was signed with Russia in 1933, and diplomatic relations, suspended because of Moscow's refusal to recognize the incorporation of Bessarabia with Rumania,

were resumed. But though in Titulescu, Rumania possessed a clever and esteemed foreign minister, Rumanian resistance to Nazi encroachment in the economic and political affairs of the Balkans weakened steadily between 1934 and 1939. Trade agreements were signed making Rumania more and more dependent upon Berlin, and the iron guard, Rumanian counterpart of Himmler's S.S., led by the ambitious Col. Ion Antonescu, began to acquire power.

Antonescu attempted a *coup d'état* in 1938, but failed. Arrested, and subsequently released by a semi-democratic govt. set up under Dr. Cristea, patriarch of Rumania, Antonescu continued his fascist activities, was arrested again in July, 1940, for his plotting with Berlin, but Sept. 5 was, under Nazi pressure, entrusted with the formation of a government on the German pattern. Next day he forced Carol to abdicate in favour of his son Michael, and was soon collaborating openly with Hitler.

Territorial Losses

This complete defeat of democratic forces in Rumania followed a series of territorial losses; June 26, 1940, a Russian ultimatum detached Bessarabia and N. Bukovina, about 19,300 sq. m.; Aug. 21, the Craiova agreement ceded S. Dobruja, about 3,000 sq. m., to Bulgaria; Aug. 30, Northern Transylvania, about 17,370 sq. m., passed to Hungary under the Vienna Award (*g.v.*) dictated by Ribbentrop. Antonescu was soon under the control of Manfred von Killinger (*g.v.*), Hitler's ambassador with special powers; the whole economic system of the country—its grain, timber, and petroleum in particular—was needed to serve the Nazi war machine; and as soon as Germany decided to attack Russia, Rumania was made to join the Axis and wage war also against that country, the prize offered being the recovery of Bessarabia and Bukovina, and of a territory of similar size called "Transnistria" comprising Podolian and Ukrainian soil between the rivers Dniester and Dnieper, and including Odessa.

In the ensuing years, Rumania had at first about 15, later more than 40 divs. engaged on the Russian front and used, *e.g.*, during the bitter struggle for Sevastopol and the Crimea, as cannon-fodder by the Germans, Rumanian losses being relatively very heavy indeed. At home there were forced labour, imprisonment or execution without trial, and an

annihilation of the large Jewish population; and from 1943, when Allied forces established themselves on Italian soil, heavy air raids, especially upon the oilfields of Ploesti and the ports, added to the sacrifices made by the people. The temporary recovery of Bessarabia and the Bukovina and an ephemeral conquest of Transnistria proved a poor recompense. When the Russian counter-offensive reached Jassy and Constanta, a new Rumanian government accepted the Allied terms for an armistice, Aug. 24, 1944, and joined the Allies. This fight also proved costly in men, Rumanian losses being estimated at 150,000.

Michael's Coup d'État

King Michael, with the support of the opposition leaders Maniu and Bratianu, though virtually held a prisoner by Antonescu and von Killinger, took an important part in his country's timely surrender. Von Killinger committed suicide and Antonescu, with his retinue, was gaoled. Several short-lived coalition govts. were formed, but did not last in face of Communist determination, with Russian backing, to secure control, and in March, 1945, Petru Groza, leader of the Ploughman's front, a small, pro-Communist offshoot of the Peasant party founded in 1934, became premier. The Communists, though a small minority in the country, rapidly usurped all power. Under the continued presence and pressure of Vyshinsky, Russian vice-commissioner for foreign affairs, a new land reform confiscated all properties of more than 50 hectares (125 acres) with merely nominal compensation, charges of treason were made not only against Antonescu and his supporters, but also against the opposition leaders; and in Nov., 1946, elections held on allegedly falsified registers gave the Groza government 348 supporters to 29 opposition deputies.

Under the peace treaty between Rumania and the Allies, agreed at Paris Feb. 10, 1947, and ratified Aug. 23, Transylvania was restored to Rumania, Bessarabia and N. Bukovina to Russia, S. Dobruja to Bulgaria. Reparations to Russia were set at \$300,000,000 (£75,000,000), payable over eight years from Sept. 12, 1944, in oil, timber, grain, machinery, etc.

In spite of protests by the western powers, an internal terror campaign continued; many democratic politicians fled during 1947 to Istanbul; the venerable Maniu was arrested in July and

sentenced in Nov. to solitary imprisonment for life. Some hundred of his followers were also arrested and condemned to varying terms of imprisonment. Four members of the National Liberal party, including the foreign minister, resigned from the cabinet, Nov. 6, and were replaced by Communists and Socialists associated with them in the United Workers' party, formed Oct. 1. The reconstituted govt. forced Michael to abdicate, Dec. 30, and the National Assembly the same day passed a bill proclaiming Rumania a republic.

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Rumba. Dance which originated in Cuba. It was typified in its early form by its frankly sexual nature. Musically it arose from the *habanera*. Its ancestry shows the influence of the Spanish invaders, African slaves, and the original Indian natives. Inter-marriage was much more general in the Latin settlements of the new world islands than on the mainland farther N., so that Spanish folk songs (already affected by African music from the time of the Moorish invasion of Spain) blended without difficulty with African slave songs. Long before the early slave ships reached the N. American mainland, new types of Afro-American dances had become established on the mainland of S. America and in the West Indies, each locality developing its own distinctive type.

In its ballroom form it was accepted in the U.S.A. between the two Great Wars. Brought to the U.K. for the first time in 1930 by José Norman, it gained sudden popularity during the Second Great War, when it became usual for night clubs to feature two bands alternately—a white swing and a coloured rumba. The music

of the rumba makes use of national idiomatic ideas in orchestration, and is basically in 2-4 tempo, while the various rhythm instruments such as string bass, guitar, maracas, clavies, bongos, and timbales produce polyrhythms of great complexity and charm. In its original form the melody was carried by voices, but its translation to the ballroom has necessitated the addition of trumpet and/or flute, clarinet, fiddle. The piano, sometimes used, is redundant.

Rumelia, EASTERN. District of Bulgaria. The middle portion is the wide level of the Maritza; it lies between the Rhodope Mts. in the S.W. and the Balkans in the N. The chief town is Plovdiv. The dist. was formerly an autonomous Turkish province under a Christian governor, an arrangement due to the Berlin treaty of 1878. In 1886, except the dist. of Kirjaby, the prov. became Bulgarian. It included the depts. of Burgas, Plovdiv, and Stara Zagara, which have an area of 17,375 sq. m. and a pop. of 2,169,335. Sheltered from the N. by the Balkans, it forms the more fertile and productive part of Bulgaria. It is noted for the culture of roses, especially in the valley of the Tunja. Burgas, on the Black Sea, is the principal port of the dist. See Bulgaria; Plovdiv.

Rumford, SR BENJAMIN THOMPSON (1753-1814). American physicist. Born at Woburn, Mass., March 26, 1753, he studied medicine and physics in his spare time. He left America during the Revolution and received an appointment in the colonial office in London, becoming under-secretary of state. He entered the service of the elector of Bavaria, 1784, and became minister of war. As a physicist he is remembered for his many discoveries on the phenomena of heat. He was the founder of the Rumford medal of the Royal Society. He died Aug. 21, 1814.



Sir Benjamin Rumford, American physicist

Ruminant (Lat. *ruminare*, to chew the cud). Name given to those even-toed hoofed mammals which chew the cud. In these animals the stomach is divided into a series of chambers. The hastily eaten and swallowed food passes into the rumen or paunch, whence it is later regurgitated to the mouth and thoroughly chewed, after

which it passes to another division of the stomach for digestion. This provision meets the needs of animals which in a wild state graze largely and hastily by night, and then lie up under cover, where the food can be masticated at leisure. Oxen, sheep, goats, deer, and camels are ruminants.

Rummy. Card game for several persons. Its rules vary widely in several versions, but the basic principles are that each plays for himself and tries to develop the hand originally dealt him (of seven or eight cards) by drawing from the pack and discarding in such a way as to collect groups of cards either of the same denomination (e.g. three or four kings) or in sequence in a suit (e.g. 8, 9, 10 of diamonds). In some variations the player may put down combinations as they are completed; in others he fills his hand and then "knocks," which allows only one more draw to each opponent. He may be allowed to take up the discard of his previous opponent; or, in a good three-handed variety, all the discards down to the one actually used to complete a combination. When any player has gone "out," the others are debited points according to the ungrouped cards in their hands. In gin rummy, a game for two, it is permissible to knock when the pipson such cards (termed deadwood) total less than ten.

Rump. End of the backbone of an animal with the adjoining parts. The name Rump Parliament is given to the remnant of the Long Parliament, left sitting after Pride had expelled the Presbyterian members in 1648. It continued to sit until expelled by Cromwell in 1653. In 1659, after the fall of Richard Cromwell, the members of the Rump were recalled. See Cromwell; Long Parliament; Pride; Restoration.

Rumpelstiltskin (Ger. *Rumpelstiltschen*). Folk-tale retold as a fairy story by the brothers Grimm. A miller's daughter is set by the king the task of spinning straw into gold. This is performed for her by Rumpelstiltskin, a dwarf magician, on condition that she gives him whatsoever he may ask; he makes her promise that in the event of her marrying the king she will give him her child. The miller's daughter becomes queen, and on the birth of a child the dwarf reappears to claim it. Having learnt his name from a messenger, the queen pronounces it, whereupon Rumpelstiltskin, after stamping his right foot into the earth, "seized his left foot with both

hands with such violence that he tore himself in two."

Runciman, WALTER RUNCIMAN, 1ST VISCOUNT (1870-1949). British politician. The eldest son of the future Baron Runciman, he was born at South Shields, Nov. 19, 1870. From Trinity College, Cambridge, he entered his father's shipping firm. He was Liberal M.P. for Oldham,



1st Visct. Runciman, British politician

1899-1900, defeating Winston Churchill 1899, losing to him 1900; for Dewsbury, 1902-18. Parl. sec. to the local govt. board, 1905, financial sec. to the treasury, 1907, in 1908 he entered the cabinet as president of the board of education. President of the board of agriculture, 1911-14, and of the board of trade, 1914-16, he resigned with Asquith in 1916 and lost his seat in 1918. During 1924-29 he was M.P. for W. Swansea, being one of the Liberal leaders in parliament. In 1929 he became M.P. for St. Ives and as president of the board of trade, introduced protective tariffs. In 1938 he headed a mission to Czechoslovakia which tried to reconcile Czechs and Sudeten Germans (see Munich Crisis), and on his return was lord president of the council until the outbreak of war. He had been raised to the peerage as Viscount Runciman of Doxford in 1937. In 1933 his father had become Baron Runciman of Shroston; on his death in 1938 this title descended to Walter, who died Nov. 14, 1949. His son Leslie (b. 1901) succeeded as 2nd Viscount and 3rd baron.

Runcorn. River port, market town, and urban dist. of Cheshire, England. It stands on the Mersey, 16 m. from Liverpool and 28 m. from Manchester, with a rly. station. Here the Bridgewater Canal falls into the Mersey, while the Manchester Ship Canal also passes by. Runcorn has docks and wharves; its industries include shipbuilding, tanning, chemicals, soap, rope, etc. A rly. viaduct and a transporter bridge cross the Mersey to Widnes. It gives its name to a co. constituency. Pop 23,400. See Bridge illus. p. 1423

Rundstedt, KARL RUDOLF GERD VON (b. 1875). German soldier. He was born at Aschersleben, Dec. 12, 1875, and joined the German army in 1892. In

1909 he was a captain on the general staff, and during the First Great War served in France, Poland, and Turkey. In 1938 he was col.-gen. in charge of army group IV, organizing the invasion of the Sudetenland; he retired at the end of Oct. on the outbreak of the Second



Karl von Rundstedt.
German soldier

Great War he was given command of an army group in Poland and was responsible for the fall of Warsaw. In 1940 he was in command of the army group which broke the French lines in the Ardennes and along the Meuse, being promoted F.-M. for his services in this campaign. He took part in the Russian campaign, 1941, but after his defeat at Rostov, he was transferred to France, being supreme commander of the W. front during 1942-44. Disagreeing with Hitler on the strategy required to meet the Allied invasion of France, he was replaced by von Kluge in July, 1944, but was reinstated in Sept., and organized the Dec. counter-offensive in the Ardennes (*g.w.*). Relieved of his command in March, 1945, he was captured May 2 at Bad Toelz, near Munich, and spent the next three years in internment in England, being repatriated in 1948. The British intention to charge him with war crimes was abandoned in 1949 on medical evidence that he was unfit to stand trial, and he was released.

Rune (Old Norse, *rún*, secret counsel). Any character in the pagan Scandinavian script. Derived, directly or indirectly, from a pre-Christian W. Greek alphabet, the first six characters in this system of writing denoted f, u, th, o, r, c. Runic alphabets are hence sometimes called futhorcs or futharks. The characters comprise uncurved strokes, adapted at first for woodcarving, and to avoid following the grain they were made upright or slanting, later proving suitable for incising bone, metal, and stone.

The old or Gothic futhorc, comprising 24 characters arranged in three groups of eight, for magical purposes, reached Scandinavia not later than the 3rd century A.D. The futhorc was ultimately replaced by the late Scandinavian system of 16 characters, represented in most extant inscriptions, as well as in MSS. Out of the earlier futhorc arose the Anglian, varying from 25 to 40 characters, and used especially in Northumbria in the 7th-9th centuries, an outstanding example being a whale-ivory casket in the British Museum.

Stone inscriptions, introduced by Norway, were adopted in Great Britain, and especially in Sweden, where more than 2,000 remain. Inscriptions, usually brief, appear upon rock-surfaces, sepulchral monuments, weapons, ornaments, utensils, and coins. Mostly—except in Iceland—older than the 11th century, when Christianity and the Latin alphabet reached Baltic lands, their use lingered in remote places to the 18th century.

In Britain runes appear on a few Jutish brooches and other objects from Kent. The Hunterston brooch, now in Edinburgh, was in the 10th century runed on the back, perhaps by Norse settlers in Man, which has yielded 24 inscribed crosses. There are 7th century runes on the Collingham stone in Yorkshire and the Bewcastle cross in Cumberland; the Ruthwell (*g.v.*) cross in Dumfriesshire is somewhat later. The earliest English coin, a gold solidus attributed to 460, bears runic characters.

Runic calendars, or primstaves, are wood or bone tablets or rings bearing characters representing the days of the year, the prime or golden numbers, and seasonal symbols. They were the precursors of the Staffordshire clog-almanacs.

The third runic stave, th (*þ*), was used in early English writing to supplement the Latin alphabet. In careless calligraphy it came to resemble y, and so appears in early printed books, although denoting in that connexion the sound th. To this is due the mispronunciation of

such sham-antique phrases as *Ye olde Englyshe faire*. See Anglo-Saxon Antiquities. Consult Catalogue of Runic Literature, H. Hermannson, 1918.

Runeberg, JOHAN LUDVIG (1804-77). Finnish poet. Born in Jakobstad, Feb. 5, 1804, he



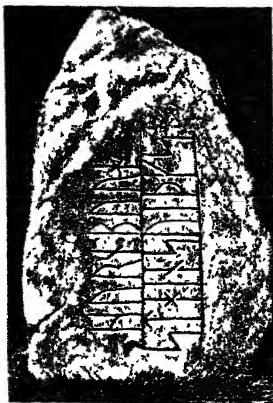
J. L. Runeberg,
Swedish-Finnish
poet

was educated at Vasa and Abo (Turku) universities. He went in 1828 to Helsingfors (Helsinki), and in 1832 started a bi-weekly literary paper, *The Helsingfors Morning News*.

In 1837 he was appointed lecturer in Latin, and afterwards in Greek, at the college at Borgå, where he lived for the rest of his life, which ended May 6, 1877. Runeberg's first book, 1830, consisted chiefly of lyrical poems, but *The Elk-hunters*, 1832, and his masterpiece, *King Fjalmar*, 1844, are epic poems of great beauty, and among the finest achievements in Swedish literature. His most popular work, *The Tales of Ensign Stål*, 2 vols., 1848 and 1860, contains the beautiful poem, *Our Land*, adopted as the national song of Finland.

Running. Sport which may be subdivided into track running and cross country running. Marathon racing is an extension of the latter. Track running may be subdivided into short, middle, and long distance racing.

Short distance racing is popularly known as sprinting. A sprint may occur at any time during a race longer than short distance, though generally at the finish. Sprinting differs from ordinary running, not in degree, but in kind. The distinguishing factor is a powerful forward thrust of the leg, delivered with all the energy of which the physique is capable, that helps to carry the body with it. Starting is also an essential attribute. Formerly runners used to start in a more or less upright attitude, but, as the art became specialised, they learned to crouch with their fingers on the mark, and from this position sprang at once into their stride. In a short distance race the maximum speed is attained at the start and sustained till the finish. A furlong was formerly considered the greatest top-speed distance; then H. C. L. Tindall, of Cambridge, went far to show that it was possible to sprint a quarter-mile.



Rune. Stone found at Kallerup, Denmark, inscribed *The Stone of Hurnbura, son of Svitha*. It dates from c. 800

Roughly speaking, middle distance running begins with the half-mile race, and concludes short of 3 m. Middle distance races are generally combination events, i.e. the second or third "string" starts at a pace he cannot maintain throughout the course, with his companions as near to him as avoidance of undue effort will permit. When he falls back exhausted, the principal takes up the running, until the race nears its end, when the best runner comes to the front and finishes at the utmost speed of which he is capable, frequently at a sprint. Sometimes the first string will be his own pacemaker throughout, but combined tactics, calling for judgement and generalship, are brought into play.

Long distance races, 3 m. and upwards, are run on the same principle, save that the first strings of the opposing teams, for some two-thirds of the distance, often keep a considerable distance behind the leaders. Sound judgement and mutual understanding are required, as otherwise the second string of one team may obtain such an advantage that it cannot be wrested from him. For long distance racing the pace for the most part should be a long, natural, springy stride. Beyond 10 m. running approximates more and more closely to pedestrianism.

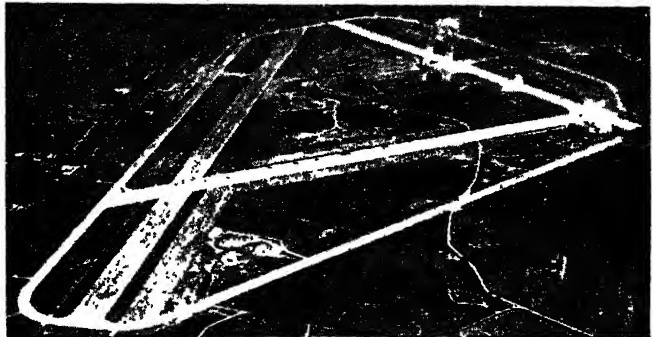
These races are run on elliptical cinder tracks, of equal breadth at either end, with a sufficient length on either side to admit of a straight course of at least 100 yds. Cross country racing, steeplechasing, harriers, paper-chasing, are varieties of the sport. Some British and Olympic records accompany the article Athletics. See Cross Country Running; Hurdling.

Runnymede. Name given to a meadow lying along the S. bank of the Thames, near Egham, in Surrey, and some 20 m. W.S.W. of London. There, on or Charter

Island in the stream, King John sealed Magna Carta, June 15, 1215. There are gates by Lutyens commemorating the event, and the meadow is now national property.

Runway. Hard-surfaced track on an aerodrome along which air-

Rupee (Skt. *rupya*, silver). Unit of currency of India and Pakistan. It is divided into 16 annas. In 1950 the Indian rupee was worth ls. 6d., the Pakistan 2s. 1d. It was first coined in 1542. A lac of rupees is written 1,00,000 ru-



Runway. Aerial view of London Airport at Heathrow, showing the main east to west runway

craft land or take off. Runways are generally laid out and built like roads, a surface of asphalt being laid on a concrete foundation. Concrete surfaces are rarely used, not being resilient enough. Most aerodromes have runways laid out in different directions so that at least one may suit the wind of the moment. In the Second Great War, prefabricated runways made of sections of steel mesh were used on advanced airstrips. See Aerodrome; Airport; Airstrip; London Airport.



Damon Runyon, American humorist

Runyon, ALFRED DAMON (1884-1946). American humorist. Born at Manhattan,

Kansas, he spent his boyhood in Colorado and was in the Spanish-American War of 1898. He wrote for Hearst newspapers in San Francisco and New York, and after the First Great War became a sports columnist and feature writer. His first publication, 1911, was *Tents of Trouble* (verse), but his fame rests on short stories, in a style partly vernacular but largely invented by himself, to suit his eccentric characters. *Guys and Dolls*, 1932; *The Best of Runyon*, 1935; *More Than Somewhat*, 1937, were popular collections. He died Dec. 10, 1946.

pees, a crore 1,00,00,000. See Crore; Lac.

Rupert. English form, through the Latin *Rupertus*, of the German name *Rupprecht*. The O.H.G. form *Ruodperht* means bright, or illustrious, in fame, and is identical with the Fr. and Eng. *Robert*. Through S. Rupert (c. 650-717), who became the Apostle of the Bavarians and founded the bishopric of Salzburg, the name became especially popular in Bavaria. Its adoption as an English name appears to be due to Prince Rupert (q.v.). From the prince's qualities as a cavalry leader the description "frank, haughty, rash, the Rupert of debate" was applied to the 14th earl of Derby, by Bulwer-Lytton, in *The New Timon*, 1845.

Rupert. River of Canada, in Quebec prov. It drains Lake Mistassini and flows W. to the lower end of James Bay. Its length is 300 m. At its mouth is Rupert House, one of the earliest posts of the Hudson's Bay Company.

Rupert, PRINCE (1619-82). Son of the Elector Palatine, Frederick V, by Elizabeth, daughter of James I of England. He was born at Prague, Dec. 17, 1619, and after some experience of fighting in the Thirty Years' War on the Protestant side, came to England in 1642. Rupert fought for his uncle Charles I at Worcester, Edgehill, Marston Moor, and Naseby, proving him-



Runnymede. Magna Carta House, built on the supposed site of the signing of the charter



Prince Rupert, Royalist soldier After Van Dyck

self a dashing if somewhat erratic leader of cavalry. In 1648 he received the command of the royalist fleet and continued in that capacity until most of his ships were destroyed by Blake, off Malaga, in 1650. Thenceforward he kept away from England until the Restoration, when he returned and saw further naval service against the Dutch. He devoted his last years to science and art, and introduced into England the mezzotint process of engraving. Prince Rupert's Drops were pear-shaped globules of molten glass which, when scratched, burst with a small explosion; they were the result of an experiment by the prince. Rupert died, Nov. 29, 1682. *Consult* Lives, J. Cleugh, 1934; C. Wilkinson, 1934; M. Irwin, 1938.

Rupert of Hentzau. Romantic novel by Anthony Hope, published in 1898 as a sequel to *The Prisoner of Zenda* (q.v.). Rupert Hentzau was a prominent character in the earlier book, but there was no "of" in his name there.

Rupert's Land. Former name for that part of Canada around Hudson Bay to which the charter of Charles II gave (1670) the Hudson's Bay Company rights of possession. Named after Prince Rupert, it was sold by the company in 1869 to the dominion, and is now divided among the provinces of Quebec, Ontario, and Manitoba and the North-West Territories. One of Canada's five Protestant archbishops is still known as the archbishop of Rupert's Land.

Rupture (Lat. *ruphura*, breaking). In medicine, the intrusion of an organ or tissue through an abnormal opening. The situation can be controlled by the pressure of a pad built in a specially constructed belt, or by a curative operation. The term is also used in the sense of breaking or bursting, e.g. rupture of a blood vessel. *See* Aneurism; Hernia.

R.U.R. (Rossum's Universal Robots). Title of a play by Karel Capek, first produced in 1923. Its theme is amplified under Robot.

Rural Dean. Ecclesiastical functionary. Known to Saxon England by 800, and well established by 1050 in France and Germany, he was introduced into Italy in the 17th century. Rural deans dealt with wills and marriage cases and tested ordination candidates; they still report to the bishop on the behaviour of clergy and laity and the condition of church fabrics, and attend episcopal synods as representatives of the rest of the clergy in their respective deaneries.

After a time their duties were virtually absorbed by the archdeacons; but during the 19th century the office again came into prominence. *See* Diocese.

Rural District. Unit of local government in England and Wales, usually a less populous area than an urban district. *See* England, p. 3078; Local Government.

Rural Rides. Descriptive and discursive work by William Cobbett. After having appeared in his *Political Register*, it was published in 1830 with the full title: *Rural Rides in the Counties of Surrey, Kent, Sussex, Hampshire, Wiltshire, Gloucestershire, Somersetshire, Oxfordshire, Berkshire, Essex, Suffolk, Norfolk and Hertfordshire: with Economical and Political Observations relative to matters applicable to and illustrated by the State of those Counties respectively*. Cobbett indulged in scathing comment, and his favourite name for London was the Great Wen.

Rurik (d. 879). Reputed founder of Russia. Various described as a Viking from Sweden or a Ruso-Varangian, he and his brothers, Sineus and Truvor, with a large band of followers, invaded N. Russia in 862. He settled at Ladoga on the Volkhov, his brothers establishing themselves at Bielozersk and Izborsk in 864. Both died, and Rurik assumed sole sovereignty. He moved his headquarters to Novgorod, built a citadel there, and soon assumed mastery over the town. Novgorod under his dominion became the capital of a powerful state, extending from Lake Ladoga to the Dvina, and from Lake Peipus to the Upper Volga.

Ruritania. Imaginary small kingdom of Central Europe which is the background to Anthony Hope's romantic novel, *The Prisoner of Zenda* (1894) and its sequel *Rupert of Hentzau* (1898). The

adjective Ruritanian has passed into the language to describe romantic political intrigue.

Rush (*Juncus*). Large genus of perennial and a few annual herbs of the family Juncaceae. Natives chiefly of the temperate and cold regions, they have smooth, round-



Rush. Leaves and flowers of sea-rush

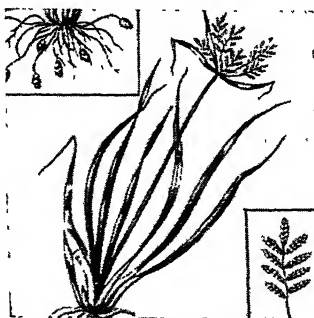
ed stems either hollow or stuffed with white pith. The leaves are flat, or rounded like the stems, or reduced to sheaths closely pressed to the stems. The green or brown flowers are very small, but rendered conspicuous by being clustered at the ends or sides of the stems. They

grow on wet soils, marshes or bogs. The pith was formerly used as wicks for rushlights; and the flattened stems are plaited into mats.

Rushcliffe. HENRY BUCKNALL BETTERTON, BARON (1872-1949). British politician, born Aug. 15, 1872. From Rugby he went to Christ Church, Oxford, and was called to the bar in 1896. Conservative M.P. for Rushcliffe, S. Notts, 1918-34, he became a baronet in 1929 and minister of Labour in 1931. He introduced the Unemployment Act, 1933, which imposed the "household means test," and retired from parliament to become, 1934-41, chairman of the assistance board that it set up. He was raised to the peerage in 1935, and died Nov. 18, 1949. A committee presided over by Lord Rushcliffe worked out the Rushcliffe scale of salaries for nurses and midwives, which was accepted by the govt., and another examined means of extending the legal aid system. *See* Nursing; Poor Persons Procedure.

Rushden. Urban district of Northants, England. It is 4 m. E. of Wellingborough and 66 N.N.W. of London, having a rly. station. S. Mary's church is a fine building, mainly in the Decorated style. Boots and shoes are manufactured. Pop. 15,100.

Rush Nut (*Cyperus esculentus*). Perennial sedge of the family Cyperaceae, native of S. Europe. It has a tuberous rootstock and grass-like leaves. The greenish flowers are clustered. The tubers are used as food in S. Europe, and



Rush Nut. Grass-like leaves and flower cluster. Inset, left, roots, showing tubers; right, flowers

when roasted are said to form a substitute for coffee.

Rusholme. District of Manchester. In the S. of the city proper, it is mainly a residential area. See Manchester.

Rushworth, JOHN (c. 1612-90). English historian. A Northumbrian, educated for the law, he



John Rushworth,
English historian

became solicitor to Berwick-upon-Tweed in 1638, and was called to the bar at Lincoln's Inn nine years later. He was a close student of the events which led up to the Rebellion, especially on being appointed clerk assistant to the commons in 1640. Secretary to the council of war, he followed Fairfax, 1645-46, and supplied parliament with news of the army's doings, an employment he continued until the conclusion of Cromwell's Scottish campaign. Rushworth was M.P. for Berwick, 1679-81, and agent for Massachusetts. He died May 12, 1690, having spent six years in a debtor's prison. His *Historical Collections, 1659-1701*, is a valuable contemporary history.

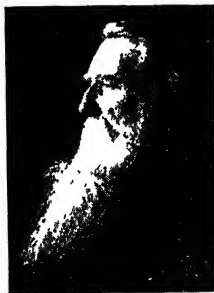
Ruskin, JOHN (1819-1900). British writer and art critic. Son of a Scottish wine merchant settled in London, Ruskin was born Feb. 8, 1819, and was educated privately. Before entering Christ Church, Oxford, in 1836, he travelled widely in France, Switzerland, and Italy, and showed active interest in art. His able draughtsmanship was revealed in architectural and floral studies carried out under Harding and Copley Fielding. In 1839 he won the Newdigate poetry prize.

An essay on Turner's painting, 1841, led the way to the first volume of *Modern Painters*, 1843, the second attracting wider attention in 1846, others appearing in 1856 and 1860. In 1851 his *Pre-Raphaelitism* championed the work of Millais and Holman Hunt; and the first volume of *The Stones of Venice* gave a careful study of the great buildings of that city. Among other publications of this period were *The Seven Lamps of Architecture*, 1849; *Lectures on Architecture and Painting*, 1853;

the comprehensive catalogue of Turner's drawings, 1857; and *The Political Economy of Art*, 1857.

In the *Seven Lamps*, Ruskin set himself to show that all good architecture was the outward expression of "certain right states of temper and moral feeling." In *The Stones of Venice* he expanded this characteristic theme, urging that the Gothic architecture of Venice was born of pure faith and domestic virtue, whereas the Renaissance work sprang from "infidelity and domestic corruption." Good architecture, he maintained, though not necessarily ecclesiastical, was essentially religious.

Ruskin became actively interested in social reform, and was an early supporter of the Working Men's College founded by Maurice, Kingsley, and others in 1854. In 1860 *Unto This Last* appeared in the *Cornhill Magazine*. It was the first of an important series of writings, supplemented by lectures, in which Ruskin attacked the materialist philosophy and the "dismal science" of political economy which seemed to overshadow his age, thus giving powerful support to Carlyle, to whom he dedicated *Munera Pulveris*, 1862. *Time and Tide*, 1867, upholds the importance of "honesty of work and honesty of exchange," and paints a new social Utopia. *Sesame and Lilies*, 1871, consists of lectures delivered



Fred
Hollier

Ruskin

in 1864 and 1865, deals with reading and education, deplores the crushing influence of industrial civilization upon art and morality; summing up much of Ruskin's most characteristic thought. *The Crown of Wild Olive*, 1866, is full of fierce denunciation, and *The Queen of the Air*, 1869, was a study of Greek myth and art.

In 1869 Ruskin was elected Slade professor of art at Oxford. He held the post until 1879, and again during 1883-84. Many of his lectures there appeared in book form as *The Eagle's Nest*, 1872; *Ariadne Florentina*, 1872; *Val d'Arno*, 1873; and *The Art of England*, 1883. *Fors Clavigera*, 1871-84, consists of nearly a hundred letters addressed "to the labourers and workmen of Great Britain," dealing with characteristically varied topics of ethics, art, politics, trade, books, legends, etc. Intensely personal and illuminated often by his most vivid phrase-

ology, it is one of Ruskin's most remarkable achievements. He followed it in 1885-89 with the autobiographical *Præterita* (new edn., with introduction by Sir Kenneth Clark, 1949).

Among the episodes of his chequered life, mention should be made of his unhappy marriage, 1848, with Euphemia Gray, who obtained a decree of nullity in 1855 and married Millais; and his later tragic and thwarted infatuation with a girl 30 years younger than himself. In 1864 his father left him over £150,000, but he lived on the proceeds of his writings and devoted his fortune to educational and social reforms. In 1878 he was sued by Whistler for libel, having written that he never expected to see "a coxcomb ask 200 guineas for flinging a pot of paint in the public's face." In later years his mind suffered severe disturbances, and he lived in comparative retirement on his estate at Brantwood, Coniston, where a Ruskin museum is maintained. He died Jan. 20, 1900.

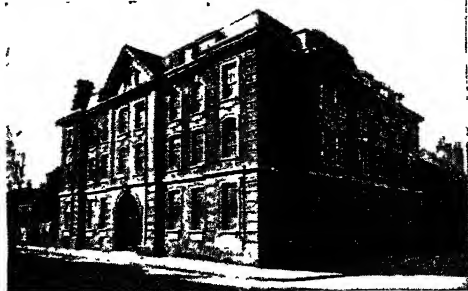
Much of Ruskin's teaching was too nebulous to have an influence more lasting than its magnificent prose expression could give. But his disinterested idealism marks him as one of the greatest Victorians, and he left his mark on the development of English art and architecture. Even if much of his vociferous dogmatism is today discounted, Ruskin will be honoured as one who succeeded in showing that, through art, everyday life must rule itself by moral standards.

J. E. Miles

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Ruskin College. British educational institute. Situated in Walton Street, Oxford, it was founded in 1899 by two Americans, Walter Vrooman and Charles Beard, to enable working men and women to undertake social studies of a university standard. It offers facilities for tuition in social and industrial history, economics, local and national government, etc. Its aim is to give opportunity for wide understanding to students

who have started work without advanced education. Students reside in the college; and there is a correspondence system of education for non-residents.



Ruskin College, Oxford. Buildings of the college for adult education, erected in 1913

Walter Vrooman was also responsible for the foundation of another Ruskin College, in the U.S.A. Founded in 1900 at Trenton, Mo., it was moved to Glen Ellyn, Ill., and in 1907 was established at Ruskin, Fla.

Russel, ALEXANDER (1814-76). Scottish journalist. He was born in Edinburgh, Dec. 10, 1814, son of a solicitor, and having



Alexander Russel, Scottish journalist

gained a practical insight into printing, became editor of *The Berwick Advertiser*, 1839. He joined the staff of *The Scotsman* (q.v.), of which he was editor from 1848 until his death, July 18, 1876. A Liberal in politics, Russel, one of the greatest journalists of his time, championed the objects of the Anti-Corn Law League, helped to secure the election of Macaulay as M.P. for Edinburgh in 1852, and opposed the participation of ministers of religion in politics. A book on *The Salmon*, 1864, reflects his enthusiasm as an angler.

Russell. Name of a famous English family. Early in the 15th century Henry Russell, a merchant, represented Weymouth in parliament, and before that date persons of this name had been prominent in the affairs of that town. His great-grandson John Russell enjoyed the favour of Henry VIII, saw military service abroad, married an heiress, and in 1539 was made a baron. His wife brought him the estate of Chenies, Bucks, and on the dissolution of the monasteries he secured large estates in London and in the

counties of Bedford, Cambridge, and Devon. In 1550 he was made earl of Bedford, and from him the later earls and the dukes are descended. Branches of the family

hold the titles of Earl Russell and Baron Amphil. See Bedford, Earl and Duke of.

Russell, JOHN RUSSELL, 1ST EARL (1792-1878). British statesman. A youngson of the 6th duke of Bedford, he was born Aug. 18, 1792. Except for a year at Westminster, he was educated privately before 1809, when he went to the university of Edinburgh. His travels included a visit to Wellington, in Portugal, after which in 1813 he entered the house of commons as M.P. for the family borough of Tavistock.

Hereditary connexions, ability, and an enthusiasm for reform combined quickly brought Lord John to the front. He was a frequent critic of the repressive legislation passed by Lord Liverpool, and in 1819 introduced his first motion for parliamentary reform. He declared for the repeal of the Test Act and for R.C. emancipation. From 1820 he represented successively Huntingdonshire, Bandon Bridge, Tavistock, Devon, Stroud, and the City of London. In 1830 he joined Grey's Whig ministry as paymaster-general and, although not in the cabinet until 1831, he was closely associated with the passing of the Reform Act of 1832, which he introduced. In 1835 he became Home secretary and leader of the house, and he remained in office until the fall of the Whigs in 1841, having been colonial secretary since 1839.

In 1845 Lord John, in a manifesto known as the Edinburgh letter, declared for free trade; and when in 1846 Peel resigned, he became premier. Palmerston was his foreign secretary, but the resignation of that minister was followed by that of the government in 1852. Of the coalition ministry under Aberdeen, Russell was a member, being foreign secretary

for a year and leader of the house. From 1855 he was out of office, but in 1859, having become reconciled with Palmerston, took under him the post of foreign secretary. In 1861 he was made an earl. He succeeded Palmerston as prime minister in Oct., 1865, but resigned in June, 1866, on the failure of his reform bill. Resigning the party leadership in 1867, he went into retirement at Richmond, where he died, May 28, 1878.

Russell was a keen reformer, to whom the cause of ordered political progress owes much. He believed in all Whig principles and sympathised with Liberal movements on the Continent, but his policy had elements of weakness. His small figure, with its large head, lent itself readily to caricature. His numerous tasteful writings include an *Essay on the English Constitution*, 1821; *Lives of Lord William Russell*, 1819, and *C. J. Fox, 1859-66*; *Recollections and Suggestions*, 1875. *Consult* *Lives*, Sir S. Walpole, 1891; S. J. Reid, 1895.

Russell's title passed to his grandson, John Francis Stanley Russell (1865-1931). Eldest son of Viscount Amberley, he became an engineer and a barrister, and was prominent through his efforts to alter the divorce law, and was also known as a Fabian and a motorist. The 2nd earl's third wife was Countess Arnim, who receives a separate entry as Russell, Mary Annette. The 3rd earl was the philosopher Bertrand Russell (v.i.).

Russell, BERTRAND ARTHUR WILLIAM RUSSELL, 3RD EARL (b. 1872). British philosopher. The younger brother of the 2nd earl, whom he succeeded in 1931, he was born at Treleek, Monmouth, May 18, 1872. He was educated at Trinity College, Cambridge, where he had an exceptionally brilliant career, securing "firsts" in mathematics and moral science, a dual approach to knowledge which was reflected in his later life. He became a lecturer and a fellow of his college. One of the leaders of symbolic or mathematical logic he attracted attention with his *Principles of Mathematics*, 1903. His chief work in this field was the massive *Principia Mathematica*, 1910, written in collaboration with A. N.



1st Earl Russell, British statesman



3rd Earl Russell, British philosopher

Whitehead (*q.v.*), which rapidly became a standard work on higher mathematics. He also wrote more popular treatises, on the mathematical basis of atomic theory and on relativity. He soon showed, however, that he had wider interests than the purely mathematical, his *Problems of Philosophy*, 1911, and *Our Knowledge of the External World*, 1914, establishing him as one of the most brilliantly clear exponents of philosophical theories. His own approach to the problems of philosophy slowly veered from an early Platonist realism to a type of mathematical logic which he made peculiarly his own and which he advocated in a series of books, the most noteworthy being *Mysticism and Logic*, 1918, and *Introduction to Mathematical Philosophy*, 1919. Throughout his career he maintained a generally sceptical approach which gave his writing a somewhat astringent flavour.

In his less academic moods he became famous with many works on general political and sociological subjects, *e.g.* *Roads to Freedom*, 1918 (partially a product of his experiences during the First Great War, when he was imprisoned as a conscientious objector); *The Prospects of Industrial Civilization*, 1923 (written in collaboration with his second wife, Dora Russell, who herself was the author of *The Right to be Happy*, 1927; *In Defence of Children*, 1935); *On Education*, 1926; *Education and the Social Order*, 1932; *Let the People Think*, 1939.

Before and during the Second Great War Russell lectured in the U.S.A., and in his writings showed a tendency to return to the more academic aspect, publishing *An Inquiry into Meaning and Truth*, 1940; a huge *History of Western Philosophy*, 1946; *Human Knowledge, its Scope and Limits*, 1948. He received the O.M., 1949.

Bertrand Russell was called the most versatile genius of his day. The mathematical work which he did in his youth may well be longest remembered; but to his contemporaries, at any rate among the general public, he was the most brilliant philosophical populariser of his time, equally attractive as a writer and as a broadcaster.

John Rowland

Russell, Sir (Edward) John (b. 1872). British agriculturist. Born at Frampton, Glos, he went to Aberystwyth university college and Manchester university, where as lecturer in chemistry 1898-1901 he specialised in fertilisers. After

running the chemical department at Wye agricultural college, he moved in 1907 to Rothamsted (*q.v.*) experimental station, of which he was director over 30 years, retiring 1943. Sir John, who was knighted in 1922, advised on food production in the First Great War, and was employed by U.N.R.R.A. in 1941 to preside over its sub-committee on agriculture. He wrote standard works on soil chemistry.

Russell, George William (1867-1935). N. Irish poet, best known by his pen name of A. E.

Born at Lurgan, Armagh, April 10, 1867, he spent his early years in Dublin, entering its school of art in 1883. He worked as an accountant, meanwhile painting, writing lyrical poems of great beauty, strongly influenced by the Eastern mystics, and in 1897 began his work with Plunkett in establishing the Irish agricultural organization society. Russell became widely known as a leader in cooperative enterprise, and no less famed as a leader in the Irish literary revival and a pioneer of the Abbey Theatre, Dublin, where his play *Deirdre* was produced, 1902. His first poems, *Homeward*, appeared in 1894; his collected poems in 1913. A. E. was overshadowed by his friend Yeats, yet such lyrics as *Hope in Failure*, *The Twilight of Earth*, and *On Behalf of Some Irishmen Not Followers of Tradition*, are likely to live. He wrote in prose *Co-operation and Nationality*, 1912; *Imaginations and Reveries*, 1915; *The Candle of Vision*, 1918; *The Interpreters*, 1922; *The Avatars*, 1933. He died July 17, 1935.

Russell, George William Erskine (1853-1919). British politician and author. Born Feb. 3, 1853, the younger son of Lord Charles



G. W. E. Russell, British politician

Russell. Prevented by ill-health from taking orders, he lived mainly in London society. An earnest Radical, he secured the

Aylesbury seat, 1880, and in 1883 became parliamentary secretary to the local government board. In 1885 he lost his seat, but representing N. Bedfordshire in the Liberal ministry of 1892-95 he was under-secretary for India, and for the home department.

As a writer Russell began by contributing a weekly column to the *Manchester Guardian*, and this developed into a series of books, personal recollections of people he had met, and genial criticisms on manners and politics. A Londoner's Log Book is fiction, while Russell also wrote a *Life of Sydney Smith*, 1905. He died March 17, 1919.

Russell, Henry (1813-1900). British singer and composer. Born at Sheerness, Dec. 24, 1813, he first appeared in public at three, and, aided by a benefactor, studied singing at Bologna. He worked in the U.S.A., 1833-40.

In England he became well known as a singer and composer of tunes to popular lyrics. Among his songs, numbering over 800, may be mentioned *Cheer, Boys, Cheer* (to Charles Mackay's words) and *A Life On The Ocean Wave*. In 1895 he published his memories as *Cheer, Boys, Cheer*, and he died in London, Dec. 7, 1900. He was the father of Sir Landon Ronald (*q.v.*).

Russell, Sir Herbert William Henry (1869-1944). British war correspondent. Born March 28, 1869, the son of the novelist W. C. Russell (*q.v.*), he was educated at the royal grammar school, Newcastle-on-Tyne, and was on the staff of the *Newcastle Chronicle*, and of the *Daily Express* from its foundation in 1900. As correspondent to Reuters he reported the Gallipoli campaign of 1915 and was on the western front until the armistice of 1918. He accompanied the prince of Wales on a tour of India and Japan. He published novels and wrote on naval subjects, his *Ark Royal*, 1942, being a memoir of the celebrated aircraft carrier. Russell died March 23, 1944.

Russell, John (1745-1906). British painter. Born at Guildford, March 29, 1745, he studied under Francis Cotes in London, was elected A.R.A. in 1772, R.A. in 1788, and became king's painter in 1789; the last appointment leading to his production of portraits of the royal family. He also painted Wesley, Whitefield, and Wilberforce. Russell had strong evangelical convictions and a taste for argument which made

him unpopular and may have accounted for his comparative lack of notable sitters. He also dabbled in astronomy. His portraits, almost wholly in pastel, are extraordinarily interesting both in pose and facial expression, soft and graceful in outline, and harmonious in colour; he was specially successful with children. He died at Hull, April 20, 1806. See Herschel, W.; Inchbald, E.; Newton, J.



John Russell,
British painter

Russell, JOHN SCOTT (1808-82). Scottish engineer. Born at Parkhead, near Glasgow, May 8, 1808, and educated at Edinburgh, St. Andrews, and Glasgow universities, he became professor of natural philosophy at Edinburgh in 1832.



John Scott Russell,
Scottish engineer

In 1835 he read a paper before the British Association on the nature of waves, in which he had carried out a series of researches, and suggested new designs of ships as a result. He came to London in 1844 and was one of the chief organizers of the Great Exhibition of 1851. Builder of the Great Eastern and other vessels, he died June 8, 1882.

Russell, MARY ANNETTE, COUNTESS (1866-1941). British novelist. Daughter of H. H. Beauchamp, she married Count von Arnim (d. 1910) and until 1914 lived in E. Prussia. In 1898 she wrote *Elizabeth and Her German Garden*, which became a minor classic. The "Elizabeth" series included *The Solitary Summer*, 1899, and *The Adventures of Elizabeth in Rügen*, 1904. Then followed *Princess Priscilla's Fortnight*, 1905; *Fräulein Schmidt and Mr. Anstruther*, 1907. Later novels were *Vera*, 1921; *The Enchanted April*, 1922; *Father*, 1931. They were characterised by humour and malicious wit which, compounded with unsentimental philosophy, made everyday events vivid. The Countess von Arnim's works were collected in 14 vols., 1929. She married in 1916 the 2nd Earl Russell (1865-1931), and died at Charleston, S.C., Feb. 9, 1941.

Russell, SIR THOMAS WALLACE (1841-1920). British politician. Born at Cupar, Fife, Feb. 28, 1841, of humble parentage, he emigrated at 18 to co. Tyrone. In 1864 he became secretary of the Irish Temperance League, in which capacity he came into touch with Parnell in the lobby of the house of commons. When Gladstone declared for Home Rule, Russell became his vehement opponent, and as Unionist M.P. for S. Tyrone, which he represented 1886-1910, had many a sharp passage with the Parnellites. In the Salisbury



Sir T. W. Russell,
British politician
E. N. Miles

ministry of 1895-1900 he was parliamentary secretary to the local government board. In 1911, sitting as Liberal M.P. for N. Tyrone, he became vice-president of the dept. of agriculture and technical instruction in Ireland. Knighted on his retirement from public life in 1918, he died May 2, 1920.

Russell, SIR WALTER WESTLEY (1867-1949). British painter. Born at Epping, May 31, 1867, he studied at Westminster art school, and exhibited at Burlington House. Elected A.R.A. 1920, and R.A. 1926, he was knighted in 1935. His works include six pictures in the Tate Gallery; *Donkeys and Kites*; *Mr. Minney*; *The Blue Dress*; *The Amber Beads*; *Cordelia*; *The Farmyard*. He is also represented at Liverpool, Edinburgh, Dublin, and Johannesburg. He died April 16, 1949.

Russell, LORD WILLIAM (1639-83). English politician. He was born Sept. 29, 1639, third son of the duke of Bedford, and went to Cambridge. After the Restoration he became M.P. for Tavistock, and in 1679 for Bedfordshire. In 1669 he married Rachel, daughter of the earl of Southampton and widow of Lord Vaughan. Identifying himself with the country party in the commons, he became prominent as an opponent of the Cabal and an advocate of the Exclusion Bill. In 1683 he was arrested as participant in the Rye House Plot (q.v.), and, on the flimsiest evi-



Lord William Russell,
English politician
After Kneller

dence, found guilty of treason and beheaded in Lincoln's Inn Fields, where a small tablet marks the spot, July 21, 1683. His fearless honesty and tragic fate made him a hero, and by the Whigs he was regarded as a martyr in the cause of civil and religious liberty. The prime minister, Lord John Russell, wrote his *Life*, 4th ed. 1853.

Russell, WILLIAM CLARK (1844-1911). British novelist. Born in New York, Feb. 24, 1844, a son of Henry Russell (q.v.), the composer, he spent seven years in the British merchant service, and retiring in 1866, took to journalism. In 1874 he produced his first



W. Clark Russell,
British novelist

novel, *John Houldsworth*, Chief Mate, the forerunner of some 50 others, among which are *The Wreck of the Grosvenor*, *An Ocean Free Lance*, *Jack's Courtship*, and *List, Ye Landsmen*. His last book, *The Yarn of Old Harbour Town*, was pub. 1905. These stories, mostly concerned with the sea and with seafaring life, enjoyed great vogue, for though the characterisation is indifferent and the plots somewhat mechanical, the power of description is great, and won the praise of Swinburne. Russell died at Bath, Nov. 8, 1911.

Russell, SIR WILLIAM HOWARD (1821-1907). British war correspondent. Born at Lily Vale, co.



Sir W. H. Russell,
British journalist

Dublin, March 28, 1821, and educated at Trinity College, Dublin, he joined *The Times* as a reporter, and on the outbreak of the Crimean War was sent on behalf of the paper to the East. His vivid dispatches which first called attention to the appalling sufferings of the troops during the winter of 1854-55 did splendid work in drawing attention to the disgraceful mismanagement of the commissariat and the medical service, and contributed largely to the fall of the Aberdeen ministry. The complaint was made, however, by the commander-in-chief, Lord Raglan, that Russell frequently divulged information to the enemy. Russell was also a war correspondent in the Indian

Mutiny, and the American Civil War, in which his truthful description of the Federal rout at the first battle of Bull Run, 1861, made him exceedingly unpopular in the North; the Austro-Prussian War of 1866; the Franco-Prussian War of 1870; and the Zulu War, 1879. He accompanied the prince of Wales on tours through the Near East in 1869 and India in 1875-76. Knighted in 1895, he died Feb. 10, 1907. *Consult Life*, 2 vols., J. B. Atkins, 1911.

Russell Divorce Case. Action leading to a legal decision in the house of lords, 1924. This decision (reversed by the Law Reform (Miscellaneous Provisions) Act, 1949), laid down that neither a husband nor a wife was permitted to give evidence of absence of sexual intercourse between them if such evidence would prove illegitimacy of a child born to the wife during the marriage. During and after the First Great War, many husbands had obtained divorces on giving evidence that their wives had borne children who must have been conceived at a time when there was no opportunity of sexual intercourse between husband and wife because the husband was on active service. The basis of the rule was the very strong presumption that the child of a married woman is begotten by her husband. A husband might still call some third person—e.g. his commanding officer—to prove that at the date when a child born to his wife must have been conceived, he could not have had sexual intercourse with her because, e.g., he was serving abroad; but he might not give such evidence himself.

The detailed day by day reports in the press of evidence in the case of *Russell v. Russell* led parliament to act on a recommendation made in 1912 by the royal commission on divorce by passing the Judicial Proceedings (Regulation of Reports) Act, 1926. This includes a declaration of the common law on the offence of publishing indecent matter in reports of judicial proceedings, and restricts newspaper reports of matrimonial proceedings to the names, addresses, and occupations of the parties and witnesses, a short statement of the charges and counter-charges in support of which evidence has been given, legal submissions, summings-up, verdicts of juries, and observations of the judge in giving judgement.

Russell of Killowen, CHARLES RUSSELL, BARON (1832-1900). British lawyer. Born of R.C. parents



Lord Russell of Killowen, British lawyer

at Newry, Nov. 10, 1832, he became a solicitor in 1854. In 1859 he was called to the English bar, practising first in Liverpool, where his ability and eloquence speedily brought him to the front. He was equally successful in London, and in 1872 became a Q.C. In 1880 he entered parliament as Liberal M.P. for Dundalk, and in 1885 was returned for S. Hackney. In 1886 Russell, now known as an ardent Home Ruler, was appointed attorney-general, a post he held again, 1892-94. Then he was made a lord of appeal and a life peer, and the same year lord chief justice. He died Aug. 10, 1900, leaving five sons. He was a great patron of racing.

Russell was one of the greatest British advocates and judges of the 19th century. From the time he took silk until his death he figured in nearly every important criminal trial. His greatest forensic feat was, perhaps, his appearance for the Irish leader before the Parnell commission; he spoke for six days and showed profound knowledge of Irish land legislation, and power of cutting criticism and of emotional appeal which has never been surpassed. He defended Mrs. Maybrick in 1889, one of his few failures to obtain a verdict in his favour; and in 1893 represented Great Britain with Sir R. Webster on the Bering Sea arbitration, speaking for 11 days. As lord chief justice, Russell presided at the trial of the Jameson raiders, 1896, and in 1899 was an arbitrator on the Venezuelan boundary commission. (See Parnell, C. S.)

His son Francis Xavier Joseph Russell (1867-1946), was born July 2, 1867, and educated at Beaumont and Oriel College, Oxford. Called to the bar, 1893, he was quickly successful as a chancery junior. He became a judge in 1919, and in 1929 a lord of appeal in ordinary, when he received a life peerage, assuming the title his father had held. He retired in 1946, and died on December 20.

Russell of Liverpool, EDWARD RICHARD RUSSELL, 1ST BARON (1834-1920). A British journalist. Born in London, Aug. 9, 1834, he became editor of the *Islington Gazette*, 1857, assistant

editor of the *Liverpool Daily Post*, 1860, and leader writer and dramatic critic of the *Morning Star*, 1861. He edited the *Liverpool Daily Post* from 1869 until his resignation through illness in 1915. M.P. for Bridgeton, 1885-87, he was knighted in 1893, and raised to the peerage in 1919, but he died Feb. 20, 1920. Russell wrote a volume of reminiscences, *That Reminds Me*, 1889; *An Editor's Sermons*, 1901; *Arrested Fugitives*, 1912; *Speculation on Hypothesis in Religion*, 1915. The title of 2nd Baron fell to his grandson Edward (b. 1895).



1st Baron Russell, British journalist

Russell Square. A London square. It is in Bloomsbury, on the Bedford estate, to the N.W. of the British Museum, and was laid out by Humphry Repton in 1801-04, on Southampton or, as they were known later, Long Fields. After the Second Great War, in which the N. side was damaged by bombs, the gardens were laid out afresh. On the S. side of the central garden is a statue of the 5th duke of Bedford (1765-1805), by Westmacott. The Russell and Imperial Hotels now dominate the E. side, where at No. 62, demolished 1905, lived Cowper when going to Westminster school. What remains of Baltimore (later Bolton) House recalls a celebrated abduction case in which Frederick, 7th Lord Baltimore, for whom it was built, figured at the Kingston assizes in 1768. Of many lawyers who have lived in the square, Wedderburn, 1st earl of Rosslyn, better known as Lord Loughborough, was an occupant of Bolton House. Sir Samuel Romilly killed himself at No. 21. Sir Thomas Lawrence lived at No. 65, since demolished; and at No. 56, since rebuilt, Mary Mitford. No. 30 is the address of the Institute of Chemistry. The square figures in Thackeray's *Vanity Fair*.

Russell's Viper Venom. Substance used in medicine as a local haemostatic. It is generally applied to the bleeding point in freshly-made 1 in 10,000 solution by means of a pledget of cotton wool, or it may be dropped on the bleeding point from a fine needle. It is particularly valuable for haemophilic patients.

RUSSIA: THE EMPIRE AND THE REPUBLIC

GEORGE SOLOVEYITCHIK, Author of *Russia in Perspective*, etc.

Here the geography and history of Russia are traced from the earliest known times, and some account is given of the literature, art, and music of this immense country, which has grown to cover a sixth of the world's land. See also articles on cities and rivers, rulers and men of letters, e.g. Boris; Don; Lenin; Leningrad; Moscow; Peter the Great; Stalingrad; Tolstoy; Volga, etc. For the Second Great War, see *Russo-German Campaigns*

Russia, officially called the Union of Soviet Socialist Republics since 1922, emerged from the Second Great War, after an initial loss of territory following the revolution, covering the whole area of the former Russian empire



Russian flag.
Yellow on red

up to 1917 and some substantial additional territories. It covered about 8,800,000 sq. m. spread over two continents from the Gulf of Finland to the Pacific and from the Arctic to the Afghan frontier. The U.S.S.R. is nearly three times the size of the U.S.A., and, occupying more than one-sixth of the earth's land surface, is the largest country in the world. Its most easterly and westerly points lie 6,500 m. apart. The distance between Cape Chelyuskin (beyond the Arctic Circle) and the town of Kushka is over 3,000 m. The distance from Moscow to Vladivostok is equal to that from the Equator to the Pole; it takes nine days and nights in an express train to cover it.

Geographers no longer divide Russia into European Russia and Asiatic Russia with the Ural mts. constituting a natural boundary. Russia is one country geographically, divided into four parallel zones which stretch across the whole territory from W. to E. The northernmost is the tundra, the next a very much larger zone of forests, the third consists of plains and steppes, the fourth, in the S.E., is desert.

The U.S.S.R. is bounded on the N. by the Arctic Ocean, beyond which lies America, separated in the N.E. by a mere 36 m. of water, the Bering Strait; on the S. by Turkey, Persia, Afghanistan, China, Mongolia, and Japan; on the W. by Norway, Finland, the Baltic sea, Poland, Czecho-Slovakia, Hungary, and Rumania; on the E. by the Pacific, and beyond by Canada and the U.S.A.

The huge quadrilateral area thus enclosed, despite its many long sea coasts, must be considered an

essentially landlocked country. Though linked by sea routes with every part of the world, Russia is poor in natural harbours. Leningrad, Kronstadt, Riga, Tallinn, Liepaja, Jelgava, and Kalinin-grad are the chief Baltic ports; Odessa, Sevastopol, and Novorossiisk the principal Black Sea ports. But the straits leading to the Baltic and the Black Sea are not in Russia's possession. Moreover, both these seas are blocked by ice for part of the winter. In the Far East the port of Nikolaevsk is frozen for six months a year, that of Vladivostok for three to four months. The Sea of Okhotsk, which separates the Kuriles (acquired by Russia in the Second Great War) from Siberia, likewise freezes every winter.

Ports have been developed at the mouths of the principal Siberian rivers, but climatic conditions reduce their period of use to a few months in the summer; the best known and largest is Igarka on the Yenisei.

In the N.W., the important and ancient White Sea port of Archangel is blocked by ice for six months

tionally long (often over 2,500 m.) and broad. W. of the Urals the principal rivers are: the Volga, with its Kama set of tributaries from the Urals, which flows into the Caspian; the Don, which flows into the Sea of Azov; the Dnieper, Bug, and Dniester, which flow into the Black Sea; the West Dvina and the Niemen, which flow into the Baltic; the North Dvina, which flows into the White Sea. E. of the Urals, the principal rivers are the Ob, the Yenisei, the Lena, and the Kolima flowing into the Arctic Ocean; the Amur flowing into the Pacific; the Amu-Daria and the Syr-Daria, flowing into the Aral.

Great lengths of all these mighty streams are navigable and are widely used for inland transport, but they all freeze in the winter. In the spring, when the ice melts, they usually flood the adjoining flat land. About ten p.c. of Russia's total goods traffic—especially timber, grain, oil, and other heavy or bulky commodities—is transported by river and canal. Some of these waterways, especially the Dnieper, are also exploited for hydro-electric power; the potentialities they offer in this field are virtually unlimited.

The principal lakes are the Caspian Sea (163,660 sq. m.—the largest lake in the world) whose surface is 85 ft. below sea level; L. Ladoga, L. Onega, L. Peipus, and L. Ilmen, all W. of the Urals; L. Balkal (5,714 ft. deep—presumed to be the deepest in the world), L. Balkhash, L. Issik-Kul, E. of the Urals.

Fish is extremely abundant in all the seas, lakes, and rivers of Russia. The Caspian Sea alone has in the N. more than 30 varieties of fish, of which the sturgeon with its black roe (caviar)—caught chiefly in the Volga near Astrakhan—enjoys world renown. Kamchatka's

shores provide about 95 p.c. of the world's crab. The mountain streams of the Caucasus abound in trout and salmon.

The birds of the rivers and lakes include every known north temperate variety: while plant life varies from the lichens and mosses of the tundras to the lilies of the sub-tropical south.

REPUBLIC AND CAPITAL	AREA IN SQ. M.	EST. POP. 1945
R.S.F.S.R. (Moscow)	6,609,000	109,280,000
Ukraine (Kiev) ..	225,200	40,000,000
Belorussia (Minsk) ..	81,090	10,386,000
Armenia (Erivan) ..	11,640	1,282,000
Azerbaijan (Baku) ..	33,460	3,210,000
Georgia (Tbilisi) ..	37,570	3,540,000
Turkmen S.S.R. (Ashkhabad)	189,370	1,254,000
Uzbek S.S.R. (Tashkent)	159,170	6,300,000
Tadzhik S.S.R. (Stalinabad)	55,700	1,485,000
Kazakh S.S.R. (Alma Ata)	1,072,000	6,146,000
Kirghiz S.S.R. (Frunze)	76,900	1,500,000
Finnno-Karelia (Petrozavodsk)	69,720	470,000
Moldavia (Kishinev)	13,200	2,200,000
Lithuania (Vilnius)	31,600	2,880,000
Latvia (Riga) ..	24,840	1,971,000
Estonia (Tallinn) ..	17,610	1,181,000
Total	8,708,070	193,035,000

in the year. Only Murmansk—a port developed during the First Great War and subsequently much expanded—remains ice-free all the year round, thanks to the Gulf Stream, thus constituting Russia's sole permanent and undisputed outlet to the world's oceans.

The U.S.S.R. is rich in lakes and rivers, many of which are excep-

Apart from the Valdai hills, which lie about half-way between Leningrad and Moscow, there are no mts. in the N.W. In the S. there are the Carpathians (over 6,540 ft.), the Crimean mts. (up to 5,084 ft.), the Caucasian mts. (up to 18,490 ft.). In the centre are the Ural mts., rising to 6,022 ft.

E. of the Urals the principal mt. ranges are the Tien-Shan (up to 22,975 ft.) and the Altai (up to 15,163 ft.). In central Asia, the Pamirs—"the roof of the world"—have the Stalin and the Lenin peaks (24,598 and 23,390 ft., respectively); S.E. Siberia is bordered by the Sayan (to 11,457 ft.), the Yablonovy or Yablonoi (to 5,284 ft.), the Verkhoyansk (7,205 ft.), the Sikhota-Alin (about 6,560 ft.), the Stanovoi, the Kamchatka (up to 15,680 ft.) with its many volcanoes, and a few lesser ranges.

CLIMATE. The climate of the U.S.S.R. is continental. The greater part of the huge land area is too far away from the ocean to be influenced by it, and in general Russia has the average temps. to be expected in its latitude. The difference between maximum and minimum temps. varies from N. to S. and from W. to E., but there are periods of the year when the climate of Russia is almost identical everywhere. There is an old saying that in the winter it is possible to go by sledge from the Baltic to the Pacific or from the White Sea to the Black Sea, while in the summer peasants work in their shirt sleeves in the Crimea and in Siberia. Winter is extremely cold even in the S.; in Jan. mean temps. range from 5° of frost around Odessa to some 15° of frost around Leningrad; while in Siberia there are often 30° and even 40° of frost. Summer is very hot; July temps. vary from about 70° F. along the Black Sea coasts to about 50° F. along the Arctic. The remoteness of oceans also results in a comparatively low rainfall with maximum averages of 24 ins. in the N. and less than 12 ins. in the S. Snowfall is usual for less than three months at Odessa and up to six months at Archangel or in the Siberian N. The small quantity of moisture is marked in the plains of the Ukraine and W. Siberia.

The most fertile soil, the black earth (*chernozem*), is found in a huge area which stretches from the Polish border to the Caspian and has made the Ukraine the granary not only of Russia, but in normal times of a large part of Europe. Its staple product is wheat. Fairly



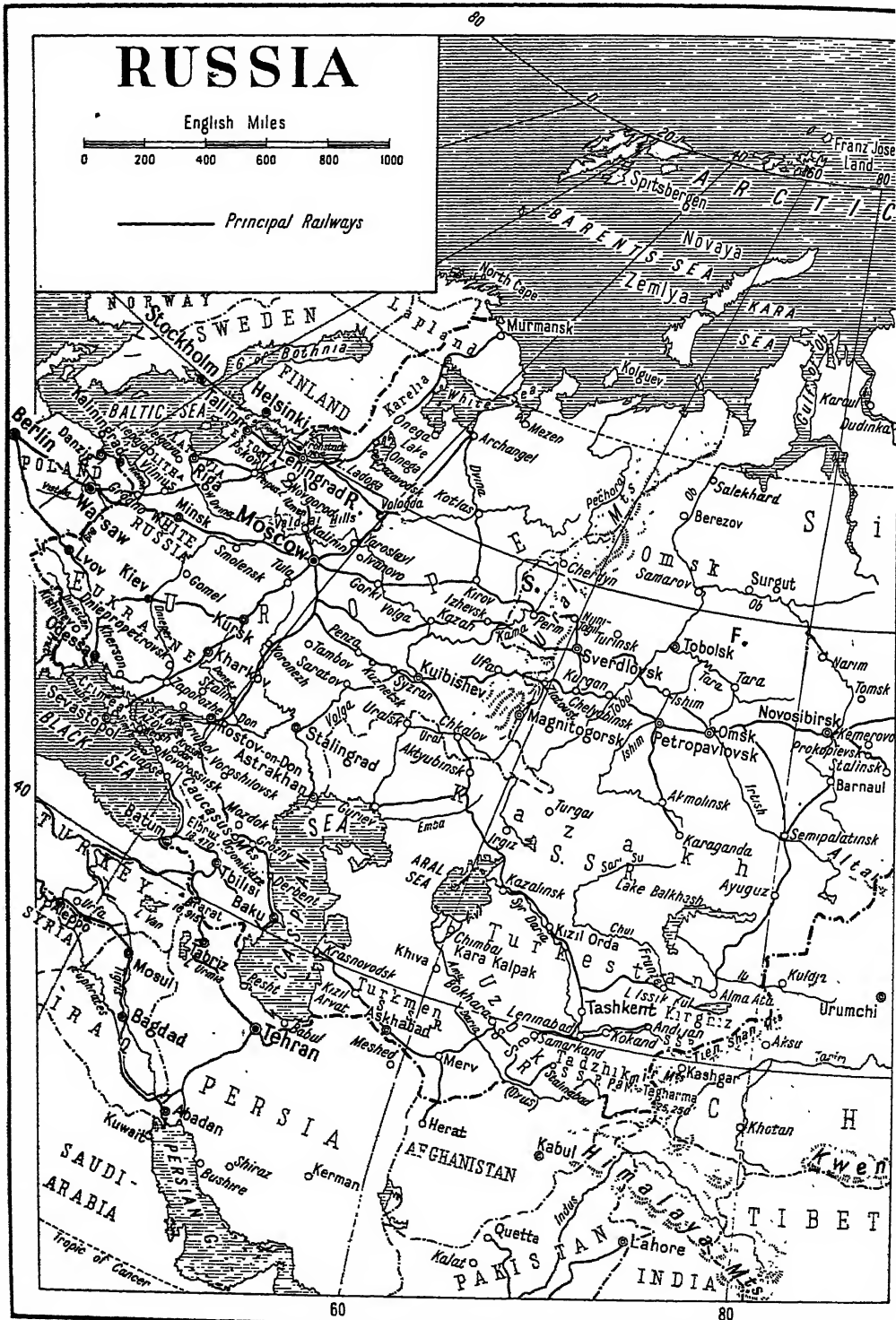
Russia. Representative types of work and workers. 1. Picking tea at the Chakva state farm in the Adzharian Autonomous Republic. 2. Newspapers on the bulletin board at the Kirov collective farm. 3. Sorting grain at the Budenny collective farm, Krasnodar Territory. 4. Meat packing plant in Moscow; boiled sausages being taken by conveyor to the cooling-shop. 5. Uzbek worker at the textile mill at Tashkent. 6. Grinding machine operator in the Stalingrad tractor works

fertile grainlands lie also between the Baltic and the Urals; they are, however, more suited to more quickly maturing crops, such as rye, oats, barley, flax, and hemp. Beyond the Urals a variety of cereals is cultivated throughout the S. regions, especially between the Urals and L. Baikal, but here climatic conditions are less favourable. In the sub-tropical climate of the Crimea, the Caucasus, and Turkestan, tobacco, the vine, tea, and cotton, are

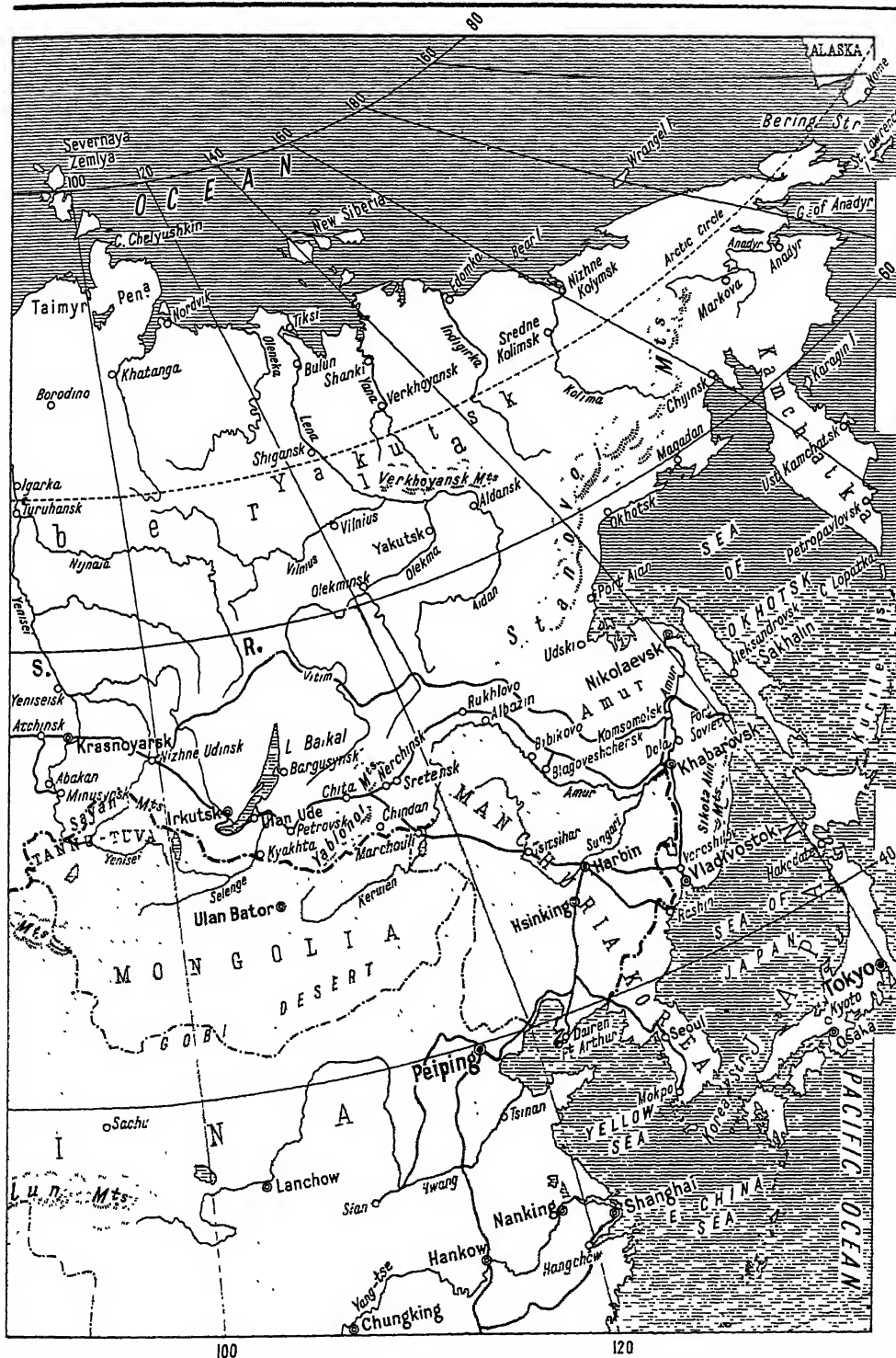
grown. Cattle breeding has now revived after a prolonged slump which was an effect of the collectivisation period.

The U.S.S.R. is enormously rich in minerals. At the turn of the century she was the world's greatest producer of petroleum. Since then she has been left far behind by the U.S.A., but in 1945 still ranked third in the world (*see table in p. 6455*).

The oil wells are concentrated as to 85 p.c. in the Caucasus;



Russia. Map showing the immense territory (more than one-sixth of the earth's land area) covered by the Union—



—of Soviet Socialist Republics, largest unit of which is the R.S.F.S.R. (Russian Soviet Federal Socialist Republic)

other rich fields have been developed between the Volga and the Urals, in central Asia, and in Sakhalin. The Donetz basin is particularly rich in coal and iron ore, and a large mining industry has been developed at Kuznetsk in W. Siberia. There is also a very old and important mining industry in the Urals area which includes coal, iron, bauxite, copper, gold, and other metals; the Caucasus and S.E. Siberia are particularly rich in manganese, while N.E. Siberia has Russia's principal gold mines. Though much scientific prospecting was done even before the revolution, under the three Five-Year Plans tremendous strides were made in ascertaining the natural treasures of the country and in establishing a number of entirely new industries to exploit them.

At the time of the German invasion of Russia in 1941 the bulk of the country's industrial production was concentrated in the Donetz basin, the Moscow and Leningrad areas, and the Caucasus; but impressive foundations for new industries beyond the invaders' reach had already been established, and these new industries played a vital part in Russia's defence after German occupation of the older industrial regions robbed her of their supply of war potential.

Forests occupy 2,360,000 sq. m., or almost a third of the whole territory. Like large parts of the plains they have a rich and varied animal life. The Siberian fur reserves are almost inexhaustible and enjoy the highest international reputation. Animal life ranges from polar bears and reindeer in the N. to tigers in the S.E. Russians are passionate hunters, and hunting has a great deal to do with the colonisation of outlying parts of the old empire.

By far the greatest part of Russia's rly. net was built before the revolution, but highly important strategic and economic rlys. were created after it in the U.S.S.R. Most of these newer lines are links between the Moscow-Leningrad region and the Urals; the Turksib rly. connects central Asia with Siberia; and in Siberia itself a network of shorter lines has been created. Though large as an absolute figure, the 58,000 m. of rlys. in the U.S.S.R. is a low total for this immense country.

Air transport is an important factor in Russian communications.

The air system, which radiates from Moscow, carries not only passengers, but also freight and mail between the capital and the outlying districts of the far N. and the far E.

The U.S.S.R. consisted in 1948 of 16 republics (see table), each divided into autonomous republics and regions. In 1939 Moscow had more than four million inhabitants, Leningrad more than three millions. Other towns with more than 100,000 inhabitants included Gorki, Rostov-on-Don, Stalingrad, Kuibishev, Novosibirsk, Voronezh, Omsk, Archangel, Irkutsk, Perm, Magnitogorsk, Krasnodar,

W. and S. Less than 100,000 live in the dist. of Birobidjan, the Jewish autonomous region of 14,000 sq. m. set aside in the Far East by the Soviet govt. in 1928. Some hundreds of thousands of Greeks live along the N. coast of the Black Sea. The Caucasus, besides some six million Georgians, Armenians, Persians, and Tartars (the latter also constitute important enclaves on the Volga and in the Crimea) has a medley of smaller mountain tribes and races which include: Ossetians, Ingushes, Kabardians, Circassians, Abkhassians, Chechenians, and Lesgians. A great variety of peoples—some of

them still nomadic—inhabit N.E. Russia, central Asia, and Siberia. Finns and Balts are concentrated in the N.W., and also form important small enclaves in the S., even in the Caucasus. The multinational U.S.S.R., however, is not a "melting pot" since the union's various peoples are for the most part localised in distribution. On the other hand, even in predominantly non-Slav parts, there are important Russian minorities.

The density of the population varies greatly. Over the whole U.S.S.R. the average is about 20 inhabitants per sq. m. But if the huge uninhabitable areas in the N. and the S.E. are deducted, the figure is about 90 per sq. m.

W. of the Urals the density is about 50 to the sq. m., E. of them about five to the sq. m. In the Moscow region, with its developed industry, there are about 260 inhabitants per sq. m. In the fecund black earth region and the Ukraine the average is about 160. The Volga area has something like 130, S.W. Siberia about 30 inhabitants per sq. m., and large areas have fewer than three inhabitants per sq. m. In the oases of Turkestan and in Transcaucasia, density varies from 65 to 155; the Caspian deserts are as empty of human beings as are the Siberian forests or the tundra of the extreme north. This inequality is to some extent inevitable in an area showing so much variety.

The colonisation of Siberia, which began with the turn of the century, the prospecting for raw materials, and the creation of new industries and industrial areas in the E. by the Soviet govt., and the development of communications have all tended towards internal migration and a redistribution of population from

SOCIAL STRUCTURE OF THE POPULATION

	Percentage of the total	
	1914	1940
Workers, employees, engineers, technical workers, etc.	16.7	31.5
Industrial workers and employees on state farms	—	3.2
Kolkhoz members and cooperative handicraft workers and artisans	—	55.5
Individual peasants (excluding kulaks) and non-cooperative handicraft workers and artisans	65.1	5.6
Land-owners, traders, rentiers, etc.	3.6	—
Kulaks	12.3	—
Students, military, pensioners, etc.	2.3	4.2
	100	100

Chelyabinsk, Grozny, Nijni Tagil, Kalinin, Tomsk, Smolensk, Murmansk, Orjonikidze, Kirov, Kerch, and Novorossiisk.

Russia's population includes nearly 200 different nationalities, races, and tribes, who, between them, speak some 150 languages and vernaculars. More than 150 million, however, are Slavs. The Great Russians predominate, constituting about 65 p.c. of the Slav total, and are spread all over the territory of the U.S.S.R. The Ukrainians, about 25 p.c., and the White Russians, less than 10 p.c., are more localised in the S. and W., the other principal Slavic groups being Poles and Ruthenians. From the time of Catherine the Great until the Second Great War, there was a compact colony of Germans on the Volga numbering in 1939 more than a million. When Germany invaded Russia in 1940, these Volga Germans were transported, it is believed, to a destination in Asiatic Russia.

There are more than two and a half million Jews in the U.S.S.R., of whom the majority live in the

the W. The nucleus of the Russian state was the principality of Muscovy. At the close of the 13th century this was still under Mongol domination, but even while the Mongols were nominally in possession, the realm of the great prince of Muscovy was growing rapidly. About 1330 Ivan Kalita controlled nearly all eastern Russia. Ivan III, Vassili III, and Ivan the Terrible successively made great advances towards the unification and expansion of their territory. The conquest of Novgorod (1478), Tver (1482), Vyatka (1484), Pskov (1511), Smolensk (1514), and Ryazan (1517), and the incorporation of a large part of Lithuania were among the principal achievements in extension. Spectacular subjugation of the former Mongol strongholds of Kazan and Astrakhan followed. Muscovy now stretched from the White Sea to the Caspian, and from the Baltic to the Urals.

Conquest of Siberia

Colonisation and conquest soon added Siberia to the tsar of Muscovy's domain, which at the close of the 17th century reached eastward to the Okhotsk Sea and Kamchatka. Peter the Great added Livonia and a part of Finland to his empire. He moved his capital from Moscow to his newly built city of St. Petersburg (founded in May, 1703), thereby "opening a window on to Europe" and initiating a new period in Russian history. Under Catherine the Great Russia gained the whole S. shore of the Black Sea, the Crimean peninsula, and, through the partition of Poland, a huge territory in the W. Alexander I annexed the whole of Finland with the Aaland Is., granting to it the status of a grand duchy with a measure of self-government. He also began to develop Alaska, where Russian settlements had been established some 50 years before, and in 1812 a Russian colony was organized in California. Under Alexander I the gradual conquest of the Caucasus was inaugurated with the incorporation of Georgia (1801), Mingrelia (1802), and Daghestan (1813). The last Caucasian tribes, however, were not subdued until 1864.

During the second half of the 19th century the Amur and Ussurisky regions in E. Asia, as well as Turkestan, Bokhara, Khiva, and Kokand were added to the empire. In 1867 Alaska was sold to the U.S.A. for 7.2 million dollars. Fort Ross, in California, had been sold to the Americans 23 years earlier. In 1875 Russia

exchanged the Kurile Is. with Japan for the S. part of Sakhalin; she had held the N. part of that island since 1860. But after her defeat in the Russo-Japanese war of 1904-05 she was compelled to cede the S. part to Japan again, regaining both it and the Kuriles, under the Yalta agreement, after the Allied victory of 1945.

Losses after First Great War

At the close of the First Great War Russia lost Finland, the Baltic provinces, and Bessarabia. The provisional government in 1917 appointed a special commission "for the liquidation of the kingdom of Poland," with the intention of carrying out a peaceful separation of Polish territory from Russia. When Germany and Austria collapsed the western Polish territories seceded from their former masters; a re-united Poland was established as a sovereign state, and proceeded to conquer parts of the Ukraine and White Russia (Belorussia) from weakened Soviet Russia.

The U.S.S.R. was established in Dec., 1922, and consisted at first of (1) the Russian Soviet Socialist Federative Republic (R.S.F.S.R.), or Russia proper; (2) the Ukrainian Soviet Socialist Republic; (3) the White Russian Socialist Soviet Republic; (4) the Trans-Caucasian Socialist Federative Soviet Republic, which comprised Georgia, Armenia, and Azerbaijan. Two years later, in central Asia, the Uzbek and the Turkmen soviet republics were formed and accepted into the U.S.S.R. In the years that followed Russia's former central Asiatic possessions were formed into the Tadzik, the Kazakh, and the Kirghiz soviet republics and joined the union and the Trans-Caucasian federation was dissolved, each of its three constituent parts becoming a republic on its own. Five more republics were added soon after the outbreak of the Second Great War—Finno-Karelia, Moldavia, Lithuania, Latvia, and Estonia.

After the end of hostilities, the area ceded to Poland by the treaty of Riga, 1921, the northern half of East Prussia, and Ruthenia, or Carpatho Russia, from Czechoslovakia, were added to Russia in Europe. In the Far East, besides S. Sakhalin and the Kurile Is., Russia acquired the formerly independent state of Tannu-Tuva on the N.W. border of Mongolia; the position of the Mongolian people's republic appeared to be uncertain. According to the constitution of the U.S.S.R., it is

a voluntary union which any state desirous of doing so can join or secede from, so that its boundaries remain, theoretically, at any rate, flexible, according to the will of the inhabitants inside and outside the union.

CONSTITUTION. The fundamental law of the U.S.S.R., adopted in 1936, which was the outcome of earlier constitutions of 1918 and 1923, was again amended in 1947. Under this constitution the highest legislative organ in the U.S.S.R. was the supreme soviet, which exercised all rights vested in the Union of Soviet Socialist Republics in accordance with article 14 of the constitution, in so far as they did not, by virtue of the constitution, come within the jurisdiction of organs of the U.S.S.R. accountable to the supreme soviet, that is, the presidium of the supreme soviet of the U.S.S.R., the council of ministers of the U.S.S.R., and the ministries of the U.S.S.R.

Form of Supreme Soviet

The supreme soviet consists of two chambers, the soviet of the union and the soviet of nationalities, and is elected for four years, the first by the citizens of the U.S.S.R. voting by election districts on the basis of one deputy for every 300,000 of the population; the second by the citizens of the U.S.S.R. voting by union republics, autonomous republics, autonomous regions, and national areas on the basis of twenty-five deputies from each union republic, eleven from each autonomous republic, five from each autonomous region, and one from each national area. Each chamber has equal rights.

Laws passed by a simple majority vote in each house of the supreme soviet are published in the languages of the union republics over the signatures of the president and secretary of the presidium of the supreme soviet. Sessions of the supreme soviet are convened by the presidium of the supreme soviet twice a year. Extraordinary sessions are convened by the presidium at its discretion or on the demand of one of the union republics. The supreme soviet of the U.S.S.R. at a joint sitting of the two chambers elects the presidium, consisting of a president, 16 vice-presidents, a secretary, and 15 members.

The highest executive and administrative organ of the state power of the U.S.S.R. is the council of ministers, which is responsible and accountable to the supreme soviet or, in the intervals

between sessions of that body, to the presidium. The council of ministers is appointed by the supreme soviet and consists of a chairman and vice-chairmen of the council of ministers, the chairman of the state planning commission of the U.S.S.R., the ministers of the U.S.S.R., and the chairman of the arts committee.

Military service is compulsory for all male citizens.

Elementary education is universal, free, and compulsory. There are state allowances for students at higher educational establishments who excel in their studies.

In 1918 the Soviet government changed from the Julian (old style) to the Gregorian (new style) calendar and replaced the old Russian weights and measures by the metric system.

HISTORY. By the middle of the 9th century the various Slav and other tribes living in the Great Russian plain had settled along its three principal highway rivers, the Volga, the Dnieper, and the W. Dvina. About the time when Alfred was fighting against the Norsemen, and 200 years before William the Conqueror invaded England, the Russians of the trading community of Novgorod invited a Varangian chieftain called Rurik to become their ruler, saying, according to legend, "Our land is great and bountiful, but there is no order in it; come and rule over us." Some historians believe Rurik was the Róric of S. Jutland who in 851 entered the Thames with 350 ships and pillaged Canterbury and London before he was defeated by Ethelwulf at Ockley in Surrey. The same Róric had the previous year successfully invaded France, and if he is the Rurik who came to Novgorod, it is likely that he did so as a conqueror, rather than in response to a peaceful invitation. But whoever he was, he and his immediate descendants established a dynasty which lasted through centuries of internecine warfare until 1598, and, unifying innumerable small principalities into one solid Muscovite monarchy, built the foundations of a highly centralised and powerful Russian empire.

About 880 the Slav town of Kiev was captured by a group of Varangians whose prince, Oleg, a kinsman of Rurik's, made Kiev the centre of his growing state. About this time also regular relations were established with Byzantium in the S. and the Scandinavian world in the N. The Kiev state

early became a military and sea power. Oleg and his immediate successors repeatedly organized expeditions against Constantinople—advancing against it on one occasion by land after first conquering Bulgaria. In 911 Oleg made an advantageous treaty with Byzantium; and in 988 Christianity was introduced into Russia from Greece, Russia becoming thenceforth subject to the continuing influence of Byzantine art and literature.

Yaroslav the Wise (1019–54) brought his realm of Kiev, through marriage, into contact with Sweden and Poland, while his three daughters were respectively wife of Henry I of France, of Andrew of Hungary, and of the Norwegian prince, Harold the Brave. After Yaroslav there were constant civil wars, the cities became the political units, and the great trading republic of Novgorod dominated the N., Suzdal, Ryazan, Vladimir, and Moscow taking the place of Kiev.

Invasion by the Mongols. In 1238 the Mongols, or Tartars, of the Golden Horde, under Batu Khan, invaded and devastated central Russia, and in a few years subjugated the whole country except the N. Their long dominion gave a distinctly oriental tinge to Russian life and the Russian people. The Mongols soon abandoned their ancestral Shamanism for Mahomedanism, but, apart from occasional outbursts of savagery, interfered little with the internal affairs of the Russian principalities. Their aim was to extort as much tribute as possible from the separate states into which the realm of Rurik was now broken up rather than to consolidate these into one powerful state. As the Mongol khanate decayed, Moscow rose to power, and under Dmitri Donskoi led the struggle for independence in 1380. The princes of Moscow thenceforward gradually drew the whole country under one ruler. In 1492 Ivan III, the Great (1462–1505), having expelled the Mongols and conquered Novgorod, made Moscow centre of govt. for all Russia.

Ivan III assumed the title of gosudar and autocrator (Gr. for emperor). Half a century later his grandson, Ivan IV, the Terrible (1553–84), had himself crowned as tsar (Caesar), in order to mark the place of the Muscovite state in Europe, and the unlimited power of the tsar within his own country. Ivan, called the Terrible because of his ruthless-

ness and savagery, was nevertheless a ruler of outstanding ability, and Soviet historians have seen in him a successful warrior and a great social reformer who fought the privileged classes—the boyars, the rich merchants, and the Church, reorganizing the domestic administration of his constantly growing realm, and compiling a code of laws called the *Sudebnik*. His terrorist praetorian guard, the Opritchniki, which shocked the historians of tsarist Russia, appears not to shock unduly their Soviet successors. Ivan fought the Tartars, the Poles, the great Swedish king, Gustavus Vasa, and many others, greatly extending his realm both E. and W. Under him also regular commercial relations were established between Russia and England, when in 1553 a series of accidents brought Richard Chancellor's ship to Archangel.

The Romanov Dynasty

Boris Godunov (c. 1550–1605) bound the peasants to the land. From 1601, invasion by the Poles, and by the Cossacks of the Don and the Dnieper, plunged Russia into anarchy. The cities combined, and under the leadership of Kozma Minin, a merchant from Nijni-Novgorod, and Prince Pozharsky, a minor nobleman, expelled the Poles from Moscow in 1612. In 1613 a national assembly, the Zemsky Sobor, met and elected a young boyar, Michael Romanov, tsar of Russia. Though the "time of trouble" was thus brought to an end, and a dynasty established which ruled the Russian empire until 1917, the election of the new tsar did not bring complete peace to Russia. Social and religious conflict continued to rage almost to the end of the century. Thus, there was a violent ecclesiastical conflict owing to the changes introduced in 1652–66 by the patriarch Nikon which caused the secession of a large body from the Church. During the 1660s, also, there was a peasant rising led by a picturesque adventurer called Stenka Razin, a Don Cossack, who gradually established his bandit rule over a large area between the Volga and the Urals. His followers included not only masses of discontented or outlawed peasants and a number of Don Cossacks, but also some Kalmucks and other Asiatic tribes. Having collected a large booty and set up his headquarters on a Caspian island near the shores of Persia, Razin returned to the Don in 1669. His success prompted him to attack Moscow; and during

1670 he seized the principal towns of the lower and middle Volga.

He advanced as far as Simbirsk, was defeated by government troops, fled back to the Don, where he was seized by the horse-owning Cossacks, who handed him over to Moscow. In 1671 he was executed, but he has remained a legendary figure in the Russian national epos.

Meanwhile, having secured Smolensk and part of the Ukraine from Poland, Russia, in 1686, concluded a perpetual peace with the Poles and an alliance with them against the Turks and the Tartars, by this act joining the coalition of Christian states directed against infidels.

Work of Peter the Great

Peter the Great (1672-1725) determined to make Russia a sea power. He created the new capital of St. Petersburg, near the mouth of the Neva on the Gulf of Finland; he secured command of the Baltic, built a fleet, and thus tried to attach Russia more firmly to the European system. In Peter's reign began the close association between the Russian and the Prussian courts and the participation of Russia in the quarrels of western Europe. Peter copied Prussian officialdom, and from the Baltic provs., which he added to his empire, came German barons to serve him. Up to the time of the revolution in 1917 many of the officials of the Russian ministry of foreign affairs were Baltic Germans, alien by temperament and upbringing from their Russian fellow-subjects. From the early part of the 18th century, Russia was a great power whose support and alliance were sought by leading European countries. During the Seven Years War Russian troops entered and occupied Berlin.

The long reign of Catherine the Great (1762-1796), who was sometimes called an enlightened despot, is often described as Russia's golden age, and Catherine was certainly anxious that both her contemporaries and posterity should so regard her reign. Setting out to make her reign brilliant and herself the initiator of a liberal era in Russia, she sought inspiration for her reforms in Montesquieu and Beccaria; but encountering the opposition of the gentry when she attempted to curtail their power over the serfs, she turned without struggle into a friend and protector of the privileged class. After the French Revolution she became a frank reactionary, per-

secuting the liberalism and advanced opinion that had developed in the early days of her "enlightened reign." But some of her purely administrative legislation was extremely good, and stood until the reforms of Alexander II, nearly a century later, put Russia on an altogether different basis, which in its turn lasted until the revolution of 1917.

Catherine the Great's Reign

Among Catherine's generals, under whose command the Russian army covered itself with glory and triumphed over Prussians, Swedes, and Turks, Suvarov ("the general who never lost a battle") deserves first place; but the outstanding figure of Catherine's reign was Prince Gregorei Alexandrovitch Potemkin—at first her lover and then her secret husband. As lover, statesman, pro-consul, administrator, diplomat, empire-builder, and coloniser he had no equal, and no one ever enjoyed Catherine's confidence in the same degree. He built, not cardboard villages as a popular legend asserts, but real cities; Sevastopol, Kherson, Nikolaev, Ekaterinoslav are of his creation. Among his diplomatic negotiations were abortive exchanges with England concerning an Anglo-Russian alliance.

Catherine's son, Paul, was murdered after a short reign; he was half mad, but the assassination shocked Europe, and the complicity in the plot of his son and successor, Alexander I, made the world think of Russians as "savages" for many years. Alexander was, however, the first of the really European tsars. He had been educated much as other princes were at that time, and he was at first inclined to liberal ideas. He played with thoughts of giving Russia a constitution, and emancipating the serfs who belonged to the owners of the estates on which they were born and lived in the same sense as did the cattle and the horses. But as he grew old the taint of madness in his family turned him into a melancholy mystic, who relied for advice upon a bitter reactionary and a crazy priest. Nicholas I, who became tsar in 1825, was scared off any movement towards modernising the government by a plot against him discovered just after he came to the throne. His blind refusal to move with the times led to the organizing of the revolutionary movement which grew later into Nihilism and terrorism. Nevertheless, even he sensed the gather-

ing storm and toyed with ideas of bringing Russian political and social conditions into line with "European standards." His son, Alexander II, after the fiasco of the Crimean War, introduced a series of liberal reforms ranging from a complete reorganization of the administration and the establishment of a wholly independent judiciary to the liberation of the peasant serfs in 1861.

Ten million workers on the land were liberated and assisted to buy land, which they held, not as individual owners, but as communes. Each village had its land, and all the villagers were entitled to their share of it. But there was in very few places enough land to satisfy the peasants, and the periodical redistribution of the strips of arable land, pasture, and wood discouraged careful farming.

This act of justice did not, therefore, bring into existence a contented peasantry, nor did the other reforms of Alexander II induce tranquillity. They were regarded merely as instalments, and this angered the tsar; he had no intention of giving the country a constitution, and he saw that nothing short of this would satisfy the agitators. Thus he went back on his liberal ideas, and after an attempt had been made to kill him, became a resolute opponent of change. This strengthened the revolutionaries and threw many who had been hitherto moderates on to the side of the extremists.

Constitutional Reform Postponed

The assassination of Alexander II in 1881 delayed the introduction of any constitutional measures for many years: the new tsar, Alexander III, was not unnaturally disinclined to listen to those who had killed his predecessor, and under the advice of Pobiedonostzév strove, on the contrary, to repress all self-governing aspirations and to impose on the whole empire with its varying peoples a rigid uniformity of discipline. He believed that God had appointed him autocrat, and that both his right and his duty were to force his will upon 120 million people. The hope that his son, Nicholas II, might relax the cast-iron system of bureaucracy and move in the direction of constitutional government was quickly dispelled by Nicholas's announcement that he would preserve the principles of autocracy as unswervingly as had his father.

From that moment disaffection spread through all classes. The

defeat of Russia by Japan in 1904 struck across the path of repression. There was an attempt at revolution in 1905, and to quiet popular discontent Nicholas was, after much difficulty, persuaded to announce the calling together of a national assembly, or *duma*, which met in May, 1906. Most of its members had been elected, on a platform of opposition to the council of ministers; they found, however, that they could exercise next to no influence. The bureaucrats had no idea of taking orders from the *duma*, and the feeble tsar, urged continually by his wife not to let his authority be weakened, took the bureaucrats' part. After less than three months' stormy sittings the *duma* was dissolved and repression was revived. Three more *dumas* were elected; the second was dismissed as the first had been; the third made no attempt to do anything, and lived out its time. The fourth *duma* was in existence when the First Great War began in 1914.

The First Great War

As soon as the army took the field it was discovered that the troops were shamefully ill-equipped. At the same time, stories circulated everywhere about the influence of a peasant-prophet named Rasputin upon the tsaritsa, and through her upon the tsar. Forced to summon the *duma* and to impeach the war minister Sukhomlinov, the tsar and the chief officials still refused for a time to put the nation's business into the hands of men whom it could trust. One prime minister after another, men of no account, mere bureaucrats, tried to keep the old system going. At last the army chiefs decided to join the constitutional reformers in laying a list of demands before the tsar, but before this could be done disorders provoked by hunger, by longing for peace, and perhaps by police provocation in a few days in March, 1917, swept away the tsardom with all its supports.

A provisional govt. was appointed by the *duma* with Prince George E. Lvov as chairman, Alexander Guchkov as head of the war office, and Paul Miliukov, leader of the Liberal party and an historian of international repute, as foreign minister. Alexander Kerensky, a Socialist lawyer, became minister of justice. From the moment of its inception, however, the provisional govt. found itself threatened and sabotaged by the soviet of workers' and sol-

diers' deputies which had arisen in Petrograd, as St. Petersburg was renamed in 1915, virtually overnight after the collapse of the monarchy. Moreover, there were paralyzing cleavages within the govt. itself between moderates and left wing members, and again between the bourgeoisie, who wanted "to continue the war to a victorious end," and the masses who were sick and tired of war and wanted to go home at once. On May 3 the Bolsheviks, who dominated the soviet, demanded the resignation of Miliukov whom they considered the chief protagonist of a "war to the end." After several re-shuffles Kerensky became premier, war and marine minister, and a very ineffective "persuader-in-chief," as he was nicknamed. Authority in Russia was rapidly disintegrating, industrial production was falling, the countryside was in a state of anarchy, and the armed forces were dissolving in chaos. Both a Bolshevik rising in July and an attempted *coup d'état* led by General Kornilov, the c.-in.-c., in Sept. failed; but Lenin, returned from exile, overthrew Kerensky's shaky govt. on Oct. 25 (Nov. 7 new style), and the soviets under his leadership established themselves in supreme, dictatorial authority. Trotsky was second in command and leading Bolsheviks occupied key posts under the new regime which, calling itself a dictatorship of the proletariat, was in fact the dictatorship of a very small group of men over the rest of the nation. In accordance with Lenin's special instruction, the extraordinary commission for the suppression of counter-revolution (the Cheka) was established on Dec. 20; and though its name was changed (e.g. to O.G.P.U.), this instrument of terrorism survived under the soviet regime, forming with the Communist party a main pillar of the system.

Soviet Expropriation Measures

Among the earliest measures taken by the Soviet govt. were the expropriation of land, factories, and real estate; the disestablishment of the Church and the creation of a strong "Godlessness" movement; the introduction of co-education; and the official suspension of ranks, titles, and discipline in the army and navy, which was described as "the pride and beauty of the Russian revolution."

After a period of wavering, Lenin concluded a separate peace with Germany at Brest-Litovsk (March 3, 1918) which accepted a serious

loss of territory and contributed to the acute economic crisis. The constituent assembly, preparatory work for which had been done under the provisional govt., met in Jan., 1918, in Petrograd and was dissolved by force since it had a non-Bolshevik majority. The old political parties—including the Socialist Revolutionaries and the Marxist Menshevik Social Democrats—were destroyed and their members persecuted. Internecine struggle grew into a violent civil war between the "reds" and the "whites." The principal "white" leaders were Admiral Kolchak in Siberia, Gen. Denikin (succeeded by Gen. Wrangel) in the S., Gen. Yudenitch in the Baltic, and the veteran Socialist politician Tchaikovsky in the north. With the inadequate and half-hearted help of the U.K., France, the U.S.A., Poland, and Japan, the "whites" for a time succeeded in freeing large parts of Russia from the Bolsheviks, but in the long run they were everywhere defeated by the red army—organized and led by Trotsky. The assassination of Tsar Nicholas II and all his family at Ekaterinburg, in the Urals, on July 19, 1918, was represented by the soviets as a "precautionary measure."

Introduction of N.E.P.

Meanwhile the economic exhaustion of Russia had reached its peak, and Lenin's hope of world revolution showed no promise of realization. He abandoned militant Communism and introduced the new economic policy (N.E.P.), which restored a certain measure of private enterprise and assisted economic recovery. The treaty of Rapallo signed with Germany in 1922 broke the boycott of Soviet Russia by the capitalist world, while the Third International (see Comintern) with its h.q. in Moscow directed and supported Communist activities throughout the globe. In 1924 Lenin died, and there ensued a struggle between his principal lieutenants, of whom Trotsky and Stalin were the leaders. Their personal rivalry turned to a great extent on the future political course to be pursued. Trotsky's contention was that world revolution was a prerequisite of Soviet Russia's continued existence since "Socialism in one country alone" was impossible.

Kamenev and Zinoviev held that the continuation of the N.E.P. would bring about a restoration of capitalism, while Bukharin and Rykov wanted more freedom for

the peasants and further limited encouragement for private enterprise. Stalin, disagreeing with all these groups, but not committing himself to any specific programme, drove them one by one from power. In 1927 Trotsky and his associates were expelled from the Communist party, and then banished. It was another ten years, however, before Stalin physically exterminated all those of the Lenin circle through the "purges" of 1936-1938.

Four Five-Year Plans

The first five-year plan was introduced in 1928, its official purpose being "the creation of socialism in Russia." One of its most striking features was the development of new industries in areas so far removed from the border as to be inaccessible to any potential foreign invader. The five-year plan was both a powerful instrument of political terrorism at home and of economic blackmail abroad. It meant the end of the N.E.P. and the collectivisation of agriculture. For a long time the peasants refused to be driven into collective farms (Kolkhoz) or state farms (Sovkhoz) and preferred to destroy their grain and cattle and to face extermination themselves, but in the end the kulaks were "liquidated" and collectivised agriculture was established.

On the completion of the first five-year plan before its time, a second, and later third and fourth, five-year plans were launched.

In 1936 a new constitution was introduced which, theoretically a most democratic document, embodied a proviso that gave the Communist party a dictatorial position; and in practice none of the freedoms it established were put into effect.

The growing threat of German militarism under Hitler affected Russian foreign policy and in 1934 the Soviet Union joined the League of Nations. Litvinov, a great protagonist of collective security, signed non-aggression pacts with one country after another.

Munich dealt this "western" policy a severe blow, and despite their mutual hatred and suspicions, Stalin and Hitler came to an understanding that was mutually advantageous at the time, concluding Aug. 23, 1939, a non-aggression pact. Within a few days the Second Great War began. For nearly two years Stalin was able to squeeze concession after concession out of Hitler, but on June 22, 1941, the Germans, without warning, attacked Russia. The course of the bitter struggle that followed

is described under Russo-German Campaigns. Space, climate, inexhaustible human resources, almost unlimited capacity of sacrifice, an impressive degree of military preparedness, and important supplies from the western allies were the determining factors of Russia's victories. But her brilliant generals also repeatedly outgeneralled the Germans, outstanding Soviet military leaders being Timoshenko, Zhukov, Koniev, Tolbukhin, Rokossovsky, Cherniakovsky, and the original chief of staff, Shaposhnikov, last of a group of brilliant young tsarist staff officers of the First Great War.

On August 8, six days before the Japanese surrender, Stalin declared war on Japan.

After the termination of hostilities, the Soviet govt. was busily engaged on reconstruction at home, with a new five-year plan, and on political activity abroad, extending her influence to the Elbe, and the Adriatic.

Post-war Relations

The friendly wartime collaboration with the western democracies, which had raised so many hopes throughout the world, soon changed into mutual suspicion and irritation. After 1946, there was no single international issue, vital or trivial, on which there was not complete disagreement between the Russians and the western democracies. The United Nations, the conferences of Foreign Ministers, and innumerable lesser meetings and consultations provided both sides with fresh occasions for stating their respective grievances (real or imaginary) and indulging in abuse of one another. The summer of 1948 brought the greatest tension over the joint four-power administration of Berlin and over the general German problem.

ECONOMIC LIFE. The turning point in Russia's economic history up to the revolution occurred during the 1860s. Then the transition from haphazard individual exploitation of the country's resources to organized capitalism took place. The first impulse towards this change came from the construction of railways, the necessity for which became so evident during the Crimean War that even the profound distaste of Nicholas I for this "destroyer of the tranquillity and the stability of the nation" was overborne by the sheer weight of events.

The principal result of this extension of communications was the opening up of larger markets for agricultural produce. For the first

time, instead of storing grain, the peasant was able to save up money and could pay the aristocracy in cash instead of in kind or in labour. The ground was thus well prepared for the liberation accomplished by Alexander II's great reforms, which became the starting point of Russia's economic and industrial development. So long as the Russian peasants—that is, the vast majority of the population—remained serfs, and so long as no real system of law existed in the country, the development of capitalism was impossible. Once the principal difficulties disappeared the exploitation of Russia's natural resources offered vast possibilities to foreign capitalists and enterprising Russians alike. Realizing that they were incapable of opening up and developing Russia's natural resources solely with their own funds (for a long time the state was the principal promoter of industry in Russia), successive Russian governments used every endeavour to attract foreign money, not only in the shape of state and municipal loans floated abroad, but by granting concessions to foreign companies or stimulating foreign interest in Russian joint-stock companies. Thus much of the history of Russian capitalism is the history of foreign capital investment in Russia. But the tsarist government, while anxious to attract foreign capital and granting it various facilities, also placed endless obstacles in its way. The laws concerning joint-stock companies in Russia, and certain restrictions imposed on Jews and foreigners, proved such a handicap to a free influx of foreign capital and unrestricted industrial development that time and again the government was forced to make exceptions or to suspend its own absurd decisions.

Rapid Industrial Development

From 300 million roubles in 1861 the state budget had risen to 2,630 millions by 1914; during the same period the annual foreign trade turnover had gone up from 248 million roubles to 2,960 millions; the value of industrial production from 160 millions to 2,792 millions; the number of factories and workshops from 9,944 to 33,519; rlys. from 663 m. to 38,560 m. In 50 odd years, therefore, Russia underwent a spectacular economic development. While this achievement was by no means proportionate to her possibilities, it was nevertheless colossal, and the Bolsheviks admitted that the solid foundations for their own plans of economic

expansion were established long before they came into power.

After the Second Great War, the economic system of Soviet Russia was based on strict state planning with a highly centralised govt. direction of industry, trade, and agriculture. The state owned all the means of production; labour was not only compulsory but workers were tied to their factories. Occasional deviations from direct state ownership were found in collective ownership under state control. According to Soviet statistics the share of industry in the total national output rose from 42 p.c. in 1913 to 78 p.c. in 1942, the share of agriculture in compensation. Production in all the old staple Russian industries increased anything from twice to ten times their pre-revolutionary figures, and many wholly new industries and industrial areas were created. Agriculture underwent not merely a complete structural change, but was also forced in the course of a few years from traditional, primitive forms of cultivation to mechanisation. Nevertheless, agricultural output rose much more slowly than industrial.

The Soviet Union used every means to develop self-sufficiency. Despite tremendous strides in industrialisation, however, and the constant discovery of more minerals and raw materials throughout the huge territory of the U.S.S.R., autarky still remained far from attainment. Through state monopoly of foreign trade Russia became an important factor in world commerce, since the concentration of all sales or purchases in the hands of the government frequently made her the largest buyer or seller of a given commodity.

Soviet Russia's principal exports are wheat and other grains, timber, oil, furs, cotton, and a variety of metals. Her chief imports are machines and equipment, scientific instruments and installations, wool, copper, tin, rubber, and other raw materials.

LANGUAGE AND LITERATURE. Modern Russian assumed its current form at the turn of the 18th and 19th centuries. It is the principal member of the Slavonic group of languages and has many roots in common with Polish, Czech, Bulgarian, Serbian, Rumanian, and other tongues of S.E. Europe. There are three Russian dialects. Two, Ukrainian or "Little Russian" and Bilorussian, or White Russian are regional; the third, "Great Russian," or Rus-

sian proper, is the official and literary language of the overwhelming majority of citizens of the former empire and of the U.S.S.R. alike.

The Russian alphabet, which is identical for all three dialects, was originally an adaptation of Greek characters, introduced by two 10th century monks, S. Cyril and S. Methodius, who translated the holy scriptures into Slavonic soon after Russia's conversion to Christianity. In 1708, however, Peter the Great modernised the alphabet, some unnecessary letters being dropped altogether while others were shaped to resemble a little more closely Latin characters. Peter's alphabet is still in force, but in 1918 the Soviet govt. introduced a much overdue spelling reform which dispensed with five unnecessary letters, thereby reducing the total from 36 to 31.

Beginnings of Literature

The origins of Russian literature date from the 10th century and the introduction of Christianity, and all the earliest writings are of a religious nature or are legends and chronicles. History begins with the chronicle of Nestor written about 1100. Great poetical qualities are revealed in the epic *Story of the Campaign of Igor* (second half of the 12th century; the story inspired Borodin's opera and ballet *Prince Igor*). During the next three centuries, chiefly because of Tartar domination, literature stagnated; but at the close of the 15th century it began to revive, the recording of pilgrimages and legal codification developing side by side with religious tracts and some very striking sermons. Moscow and Kiev were the centres of these literary activities which in the 17th century came under strong western influences.

Lomonosov, in his poems, dramas, and scientific works, gave Russian literature a European turn; other notable 18th century pioneers were Gabriel Derzhavin, poet and ode writer (1743-1816); Denis Fonvizin, satirical playwright (1744-92); Nicolas Novikov, humanitarian and freemason (1744-1818); Alexander Radishchev, humanitarian and political thinker (1749-1802). The historian and novelist Nicolas Karamzin (1766-1826) introduced "sentimentalism" and the "elegant style" of Russian prose which he modernised almost beyond recognition. Basil Shukovsky (1783-1852), poet, translator, and pedagogue, created the modern poetical language, while Ivan Krylov (1768-

1844) ranks as Russia's La Fontaine. His beast fables, rendered into perfect English verse by Sir Bernard Pares, retained their popularity into Soviet times and are the source of many quotations. The brilliant satirical play in verse by Alexander Griboyedov (1795-1829), *The Misfortune of Being Clever* (also translated by Pares), is another all-time classic and permanent source of quotations.

But the greatest Russian poet, as well as a prose writer of unique merit, is Alexander Pushkin (1799-1837). Unfortunately his lyrical poems or long dramas and humorous novels in verse have not so far found an adequate English translator (there are some very good German versions), and it is therefore difficult for an English reader to appreciate his romantic genius, the exquisite perfection of his style, or his amazing versatility.

Very close to Pushkin, and likewise both a poet and a novelist, is Michael Lermontov (1814-42). Byron exercised a strong influence on both Pushkin and Lermontov. Of a very different kind was the talent of Nicolas Gogol (1809-52) whose prose works and plays (especially *The Dead Souls* and *The Government Inspector*) have achieved world renown. His inexhaustible imagination, wit, sarcasm, and powers of observation, combined with lucidity of style, are easier to appreciate in translation than are the qualities of his two great poet contemporaries.

Three Great Novelists

The middle and the second half of the 19th century were exceptionally rich in novelists, political thinkers, essayists, poets, and dramatists who represent every variety of school: westerners, Slavophiles, humanists, populists, believers in art for art's sake, classicists, romantics, peasant poets, etc. Most of their works form a definite part of every educated Russian's literary inheritance, but are too local in their character to lend themselves to easy translation or to command much interest outside their own country.

Only three great novelists of that period have achieved world fame and enjoyed a lasting popularity in and out of Russia: Ivan Turgenev (1818-83), Theodore Dostoevsky (1821-81), and Leo Tolstoy (1828-1910). Belonging to a different generation, but not less famous at home and abroad, is Anton Chekhov (1860-1904), whose plays and short stories are remarkably popular. Maxim Gorky (1868-1936) first attracted

attention as a proletarian writer, then achieved striking literary success and ended as a political figure in the Soviet Union rather than a creative artist. Among the many prose-writers of the same or a slightly younger generation, Leonid Andreyev (1870-1919), the Nobel prize winner Ivan Bunin (b. 1870), Michael Artsibashev (1878-1927), Alexander Kuprin (1870-1938), Dmitri Merezhkovski (1865-1941) achieved a somewhat temporary fame at home and abroad, while a galaxy of brilliant poets (symbolists, acmeists, and other groups), hardly known outside Russia, included Valery Briusov (1873-1924), Constantine Balmont (1867-1943), Vyacheslav Ivanov (b. 1866), Alexander Blok (1880-1921), Andrew Bely (1880-1934), Nicolas Gumilev (1886-1921), and Anna Akhmatova (b. 1888). In the cultural and artistic panorama of Russia these poets occupy a place all their own: they have meant a great deal to the Russian intelligentsia both before and after the revolution.

Writers Driven into Exile

During the early years of Soviet govt. almost all literary activities came to a stop in Russia and some of the leading writers were driven into exile. Gradually, however, there developed a new literature which expanded considerably with the return to national rather than ideological tendencies just before and specially during the Second Great War. Most of the new writers of this period were born just before the turn of the century and received a liberal education, while a few particularly well-known ones belonged to an earlier generation. Thus Alexis Tolstoy was born in 1883, Ilya Ehrenburg in 1891, Eugene Zamyatine in 1884, and Michael Bulgakov in 1891. But Isaac Babel (1894), Valentine Katayev (1898), Leonid Leonov (1899), Nicolas Tikhonov (1898), Boris Pilnyak (1894), Michael Zoshchenko (1895) were typical representatives of the new intelligentsia. A still younger generation included men like Michael Sholokhov (1905), Benjamin Kaverine (1902), and the great literary discovery of the Second Great War Constantine Simonov, born in 1918. These authors, and many others of varying talents and tastes, wrote mostly in a strong realistic fashion, or else—like Ehrenburg—in a polemical and sarcastic style.

The post-revolution era produced no poets of great merit, the early proletarian or revolutionary writers of verse such as Kluyev,

Essenin, Mayakovsky, and Bedny fading into insignificance.

ART. The origins of "old" Russian art go back to the 11th century, when Byzantine influence firmly established itself soon after the introduction of Christianity. In the building of churches it gradually acquired specific forms of its own where oriental influences blended harmoniously with those from Byzantium. "Onion"-shaped golden cupolas (usually a large central one and several smaller ones) became one of its main characteristics. Under Ivan III, the Italian masters, who built churches and palaces in Moscow, introduced Renaissance elements into Russian architecture.

Old Churches and Icons

Simultaneously with building, painting was likewise stimulated by the introduction of Christianity and was exclusively devoted to holy icons or church mosaics and frescoes. Moscow, Kiev, Novgorod, Rostov, and many other ancient cities possess some unique examples of churches built in the 11th-17th centuries (some in stone and some in wood) with the rarest icons or murals.

"Modern" Russian art began to develop at the close of the 17th century under the influence of Polish baroque. Throughout the 18th century, following the creation of St. Petersburg, this art rapidly expanded into a variety of forms—mostly through the works of the great Italian and French architects who built the principal imperial or private palaces and churches of the new empire. B. Rastrelli (1700-71) was the creator of Russian rococo style (the great palace at Tsarskoe Selo (now called Pushkin) is the best known of his works). Classicism was brought to St. Petersburg by Vallin de la Mothe (1729-1800), Thomas de Thomon (1754-1813), G. Quarenghi (1744-1817), C. Rossi (1775-1849), and the Scotsman Ch. Cameron (up to 1811). Russian architects, some of whom followed these foreign masters and most of whom created a synthesis between rococo or classicism with the ancient native style, included V. Bashenov (1737-99), M. Kazakov (1733-1812), the builder of the Kazan cathedral in St. Petersburg, A. Voronikhin (1760-1814), the builder of the admiralty in St. Petersburg, A. Zakharov (1761-1811), and other men of talent.

Throughout the 19th century Russian Empire style was prevalent; between 1900 and the revolution contemporary architects

sought their inspiration either once more in ancient native forms or in Italy (Palladio, etc.).

A great deal of building was done in the Soviet Union during the 10 years preceding the Second Great War. Government and office blocks, hospitals, schools, theatres, factories, and large housing schemes gave Soviet architects the opportunity of trying every conceivable style—from the ancient and classical to the functional and constructivist.

Best known amongst these new builders are Iofan (in charge of the construction of the palace of Soviets in Moscow) and Shchusev, whose principal works include the Lenin mausoleum in Moscow's Red Square and the Marx-Engels-Lenin institute in Tbilisi. The revolutionary dynamo-monumental designs for the palace of labour to be built in Moscow by Tallin created a sensation, as did his project for the Third Internationale monument in Leningrad. Both plans, however, were abandoned and their author, who started with the plaudits of the Soviet officials, ended by incurring severe criticism.

Religious and Secular Painting

Painting, up to the 18th century almost exclusively religious, attained remarkable artistic forms. The outstanding icon painter of the earlier period was a monk called Andrew Rublev (1360-1427). With the arrival of the St. Petersburg period of architecture, new objects were chosen by artists: portraits, historical subjects, genre, landscapes became popular subjects of painting, while religious themes still exercised a great fascination on the rapidly growing school of classical Russian masters, among them D. Levitzky (1735-1822), V. Borovikovsky (1757-1825), O. Kiprensky (1773-1836), A. Venetsianov (1779-1847), and A. Ivanov (1806-58). Landscapes by Ivan Shishkin (1831-1898), the striking military canvases of V. Vereshchagin (1842-1904), the portraits and historical pictures of Ilya Repin (1844-1900) constituted the pride of the Russian school of painting recognized by the Soviets just as they were in tsarist times. A group of talented romantic painters who followed these great masters includes V. Vasnetsov (1848-1927), T. Levitan (1861-1900), M. Vrubel (1856-1910), and M. Nesterov (1862-1942). An early impressionist portrait painter of genius was V. Serov (1865-1911). The expressionist K. Petrov-Vodkin (1878-1939), the abstractionist V. Kandinsky

(1866-1944), and the surrealist M. Chagall (b. 1887) achieved more than national fame.

Sculpture developed rather late in Russia, since the Church did not approve of effigies even of a religious character. However, under the emancipating western artistic influences of the 18th century, and the new urge to put up monuments to tsars and national heroes, sculpture, too, began to attract native talent. The earliest Russian sculptors included T. Shubin (1740-1805), M. Gordeyev (1749-1819), M. Kozlovsky (1753-1802), and A. Loganovsky (1812-1855). A great Russian sculptor was Mark Antokolsky (1843-1902).

MUSIC. Up to the 17th century there was no music in Russia beyond church music and folk songs. These existed side by side for centuries without coming into any contact. Indeed the Church was opposed to folk music and in the year 1636 the Patriarch Jehosaphat had all musical instruments solemnly burnt in Moscow. Towards the close of the 17th century, however, a notable importation into the Moscow liturgy was a medley of new melodies from the S.—mostly from the Ukraine (where the people seemed to be endowed with great musical sense and wonderful voices) and from Greece. In 1735 the Empress Anne invited the Italian opera to the theatre at her palace in St. Petersburg, and the Italian singers made a profound impression. Many other Italian masters (singers, composers, and musicians, including Cimarosa and Sarti) visited Russia in the second half of the 18th century, and before long Russia also had a talented composer of her own. This was Dmitri Bortnyansky (1751-1825) who was trained by Italian masters, first in St. Petersburg and then in Italy. He was appointed director of the court choir in 1796 and greatly improved its quality by recruiting Ukrainian singers as well as widening its repertoire. Under Catherine the Great, secular western music—mostly French, Italian, and German—gained immense popularity.

In 1802 the Russian Philharmonic society was established; for more than a century it remained a great centre of musical culture. The Napoleonic invasion stimulated much latent national talent, and several patriotic operas as well as many songs were written.

Michael Ivanovitch Glinka (1803-1857), however, was the first Russian composer of note. His best known opera, *A Life for the Tsar*

(1836), though it has never become popular outside Russia, inside the country continues to be a popular classic. After the revolution it was renamed *Ivan Susanin*, thus transferring the emphasis from the tsar to the peasant who, according to the legend, sacrificed his life for his master. Another popular Glinka opera is *Ruslan and Ludmila* (1842), the libretto of which is based on a poem by Pushkin. The more realistic A. S. Dargomishsky (1813-1869), also took some well known works by Pushkin as libretti, e.g. *Rusalka* and *The Stone Guest*.

During the second half of the 19th century Russian music entered upon a period of exceptional brilliance that lasted until the revolution. Anton Rubinstein (1829-1894), himself a prolific composer of operas, oratorios, and songs, was best known throughout the western world as a dazzling pianist virtuoso. But his greatest contribution to Russian music was as a teacher and organizer, and as conductor and director of the Imperial Russian Musical society, which he founded in 1859, and the St. Petersburg conservatoire. His brother Nicolas (1835-1881) founded the Moscow conservatoire in 1864, and was likewise an outstanding teacher as well as a brilliant performer.

Tchaikovsky's Popularity

Perhaps the greatest pupil of the St. Petersburg conservatoire was Tchaikovsky (1840-1893). The western world knows him best for his symphonies, his many lyrical songs, and his ballets, but in Russia his operas *Eugene Onegin* and *The Queen of Spades*—based on works of Pushkin bearing similar names—remain popular.

A group of composers called in musical history the "mighty band" (*moguchaya kuchka*) enjoy equal fame at home and abroad. They were Caesar Cui (1835-1918), Modest P. Mussorgsky (1839-1881)—young officers both of them, Mily Balakirev (1837-1910), a university graduate, Nicolas A. Rimsky-Korsakov (1844-1908), a naval cadet and subsequently a naval officer, and a young professor of chemistry called Alexander P. Borodin (1834-1887). Under the brilliant leadership of the last named, the members of this circle mastered musical technique, evolved a style of their own in which Russian folk songs and eastern melodies were often the basis of their compositions, and created a number of operas amongst which Boris Godunov by Mussorgsky, Prince Igor by Borodin, Sadko and

The Invisible City of Kitezh by Rimsky-Korsakov, have taken a permanent place in the international repertoire—the interpreting genius of Chaliapin having undoubtedly contributed to this popularity. All the members of the "mighty band" also wrote songs, symphonies, and ballet music. Slightly younger, but still closely associated with them, was Alexander K. Glazounov (1865-1936). Though a prolific composer and a gifted conductor, his greatest contribution to Russian music, like that of Anton Rubinstein, was his work as director of the St. Petersburg conservatoire. Under Glazounov's management it trained some very great performing musicians.

The principal composers of the generation that followed the mighty band were Alexander N. Scriabin (1871-1915) and Serge V. Rachmaninov (1873-1942). Scriabin's best known works are the two symphonic compositions *Poem of Ecstasy* and *Prometheus*. Rachmaninov was equally famous as composer and as pianist. He, too, wrote an opera *Aleko* (1892), based on a poem by Pushkin. Rachmaninov was a pupil of S. Taneyev (1856-1915), himself a composer of distinction, who has sometimes been described as the Russian Brahms. Igor F. Stravinsky, born in 1882, was a pupil of Rimsky-Korsakov, but not in any way his follower. His ballets *Petrushka* and *Fire Bird* achieved world renown, and another of his ballets, *Le Sacre du Printemps*, caused something like a riot when it was first produced in 1913. Stravinsky went to live in France before the First Great War, and then to the U.S.A.

Soon after the Soviet revolution, some of Russia's leading musicians preferred to emigrate, most of them settling either in Paris or in New York. Stravinsky was already outside his country, but Rachmaninov, Grechaninov, Medtner, later on Glazounov, Prokofiev, and others, became political refugees; only Prokofiev returned after a few unproductive years in exile.

Ten years younger than Stravinsky, Serge Prokofiev was a classicist, a purist, and a proletarian in turn. He enjoyed great popularity and respect in the U.S.S.R. until the close of 1947, when a public rebuke was administered to him by the Communist authorities for being too "bourgeois" and fanciful. A similar rebuke was addressed to two other musicians who had achieved great renown in the U.S.S.R.: Dimitry Shostakovich

(b. 1909) and A. Khachaturian (b. 1904). Shostakovich's early opera, *Lady Macbeth of Mtsensk*, first produced in 1934, enjoyed considerable success, but was later condemned for its "vulgar naturalism." His 5th symphony, however, first performed in 1938, was proclaimed a work of genius, and his 7th, or Leningrad, symphony, composed during the siege, made him a national hero. Khachaturian based much of his music on his native Armenian folk lore.

Other composers of the Soviet era include I. Dzerzhinsky, who wrote the operas *Kind Flows the Don* and *The Uprturned Soil*, based on Sholokhov's novels; A. Mossolov (b. 1900), whose second symphony was widely acclaimed, while an earlier work called *Iron Foundry* was severely criticised by the Soviet press. Older musicians who, though not in the top rank, occupy a prominent position in Soviet music include Myaskovsky (b. 1881), Feinberg (b. 1889), Aleksandrov (b. 1889), Roslavets (b. 1880), Gnesin (b. 1883), Gliere (b. 1875). The Soviet authorities have given much attention to the stimulation of regional music, especially among the eastern tribes and nationalities of the U.S.S.R. Not only Armenian and Georgian, but even Bashkir and Turkoman music has materialised, while Uzbek S.S.R. has produced an opera of its own.

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Russian Ballet. Originally, ballet as taught at the Imperial ballet school, St. Petersburg. (See Russia: Music), from the middle

of the 18th century, and from the middle of the 19th was a principal element in Russian artistic life. Until the beginning of the 20th century most of the ballet masters were of French or Italian origin, though all the dancers were Russian. About 1907 Serge Diaghilev (*q.v.*) brought together his own ballet company, and it is this company which gave to the W. its idea of Russian ballet. In Russia the ballet continued on traditional lines. After the Revolution academic standards were, if possible, even more rigidly maintained, and the most successful ballets at Moscow or Leningrad were full-length works by Tchaikovsky performed in the full splendour of their imperial setting. See Ballet.

Russian Soviet Federal Socialist Republic. This largest portion of Soviet Russia is mentioned under R.S.F.S.R., but for its topography, etc., see Russia.

Russky, NICHOLAS VLADIMIROVITCH (1854?-1918). Russian soldier. Born March 6, 1854, at Kiev, he was educated at the staff college, St. Petersburg, and entered

the army as a lieutenant of infantry in 1874. In the Russo-Japanese War, 1904-05, he held the rank of general and was chief of staff to the 2nd army under Kaulbars. On his return to St. Petersburg he acted as assistant minister of war. On the outbreak of the First Great War he led the 2nd army on the S.W. front, and greatly distinguished himself by taking Lemberg (Lwow). In command of the army of the Niemen, he forced the Germans to retreat into East Prussia. At the beginning of 1917 he was again in command of the northern armies. On the formation of the provisional government under Prince Lvoff, Russky assisted in securing the abdication of Nicholas II. But incurring the displeasure of the councils of workmen and soldiers' deputies, he was dismissed, and was said to have been murdered by the Bolsheviks.

Russo-Finnish Wars. The fighting between Russia and Finland, 1939-1944, is described under Finland: Russo-Finnish Wars (*q.v.*).

RUSSO-GERMAN CAMPAIGNS, 1941-45

Maj.-Gen. Sir Charles Gwynn, K.C.B., D.S.O.

This account describes the invasion of Russia by Germany in 1941, the long retreat of the Russians to Stalingrad, and their amazing recovery and invasion in their turn of Germany. See also Second Great War, 1939-45

At dawn on June 22, 1941, Germany attacked Russia without warning. It seemed at the time that she had chosen her moment well, and military opinion all over the world was almost unanimous in believing that she was assured of another swift and crushing victory. Her armies after nearly two years of war experience had reached the highest standard of training and were convinced of their invincibility, their armament had been perfected, and they had no other serious commitments. The British Empire alone stood in arms against her; but since the defeat of France in June, 1940, the danger of further Allied action in W. Europe appeared to be negligible. Moreover, Great Britain had recently suffered heavy reverses in Libya and in Greece, and her naval position in the Mediterranean had been immensely weakened by the loss of Crete. Germany was in no danger, therefore, of a diversionary attack on the flank through the Balkan peninsula all the states in which she had either conquered or forced into the rôle of satellite allies. Even though Turkey

adhered to her alliance with the U.K. she remained neutral, and Germany had extracted a treaty of friendship from her. The fact that Germany had to maintain considerable forces in occupied countries and to guard the western seaboard was not a serious commitment, for the troops so employed constituted a potential reserve available to change places with troops that might have suffered or become exhausted in active operations. The sole unfavourable condition was that, because the fighting in Greece had been more prolonged than anticipated, the attack on Russia had been postponed for a month beyond the intended date, and a month of the favourable campaigning season had thus been lost. Furthermore, the operations of the R.A.F., based on England, although they had not as yet seriously affected Germany's war industries, had begun to immobilise a proportion of her man power in A.A. defences, and to divert part of her war industries to the same purpose. But these unfavourable circumstances were not of such gravity that they were

expected to prevent a rapid victory over Russia.

Some of the German generals believed that though Russia might be rendered impotent, she could not be completely crushed if her people retained the will to fight. But Hitler relied on the opinion of those who considered this belief outdated, and that Russia's inexperienced army and undeveloped war industries could not withstand the shock of a *blitzkrieg* attack. Moreover, Germany could call on the resources of manpower and industries of the satellite and occupied countries to compensate for whatever advantages immense size gave to Russia. Russia on the other hand not only stood alone, but had to retain some of her best troops in the Far East in face of possible attack by Japan.

When Germany attacked, she secured at once the advantages of the initiative and a considerable measure of surprise. The attack was not, of course, altogether unexpected; but Russia had on a war footing only the covering force which had invaded Poland in 1939. Her main armies had still to be completely mobilised and deployed in their war stations. These were apparently behind the pre-1939 frontier on what was called the Stalin line, stretching from the Gulf of Finland to the mouth of the Dniester. This line was not a completely fortified zone, though it contained fortified pivots, but rather the position selected for deployment of the main army, behind the covering army of considerable strength deployed in Poland and in the Baltic states, whose mission was to fight for time in case of attack.

Opening of German Onslaught

The German onslaught on Russia, as on other countries, opened with a surprise air attack on airfields and the bombing of cities which formed centres of communication and control. Concentrated artillery bombardment, followed immediately by infantry attacks supported by tanks, breached the defences of the boundary into Russian-held Poland, and opened the way for panzer columns of tanks and motorised infantry. The tactical aim was apparently to effect breaches at intervals of about 25 m. and to strike with the panzer columns at the lines of retreat of the Russian troops, which could then be destroyed by the slower moving main bodies. The Russian plan to meet these tactics was in

general for the infantry to stand their ground and to prevent the German main bodies from closing up behind the panzer forces; it was at times effective, but was desperately costly when it failed. One result was that fighting often extended 30 m. or more W. of points the Germans claimed to have reached, a development that greatly increased the difficulty of maintaining supplies to German spearheads, and contributed to eventual loss of momentum.

Brauchitsch in Command

German strategical aims were soon disclosed. The offensive took the form of three divergent thrusts. Von Brauchitsch was in supreme control, as he had been in the W. His three groups of armies had each its separate aim. The northern group under von Leeb struck from E. Prussia towards Leningrad; the central and strongest group under von Bock advanced from German-occupied Poland on each side of the Pripiet marshes with its weight in the corridor between the Dvina and the Dnieper directed on Smolensk, and with Moscow as the ultimate goal. On the right von Rundstedt's group, with a strong Rumanian contingent, had to force the passage of the great rivers flowing into the Black Sea, clearing Bessarabia and the Ukraine, with the industrial region of the Donetz basin, the Black Sea ports, and the Crimea as its more distant aims.

All objectives selected were of vital importance to Russia, not only on sentimental and political grounds, but also because they were centres of war industries, and the Red army was therefore likely to fight for their protection with most of its available strength, leaving little in reserve for counter-offensive action. Had the Germans concentrated on the attack towards Moscow, they would have been liable to attack in flank, and would have been forced to employ large forces in a defensive rôle. The strategy adopted was an indication of the confidence of the Germans in their ability to conduct successful offensive operations in all three directions regardless of disparity in numerical strength.

That confidence seemed at first fully justified, for though the Russians fought gallantly their covering armies were unable seriously to delay the German advance or to carry out a well coordinated withdrawal, and they suffered a number of disasters, perhaps exaggerated in German communiqués. The invasion flood

progressed at an average rate of more than 20 m. a day until the Stalin line was reached. There, however, the main Russian army was organized in three groups under Voroshilov in the N., Timoshenko in the centre, and Budenny in the S., and the attack lost momentum in the face of determined resistance. Von Leeb, after being slightly checked on the Dvina, met stiff resistance about Pskov and on the line between L. Ilmen and the S. end of L. Peipus. His left wing, however, swung W. of L. Peipus into Estonia on Aug. 2, and by the end of the month had cleared the whole of that state, forcing the Baltic fleet to withdraw to its base at Kronstadt. After heavy fighting he turned the N. end of the lake. Von Leeb's right had during this period worked round L. Ilmen, capturing Novgorod and thus interrupting directly communication between Leningrad and Moscow. By the early part of Sept. Leningrad was almost encircled, and the Germans made desperate efforts to take it by storm. But the Russian regular troops, exhausted and disorganized, were valiantly supported by the citizens. The Germans closed in to within easy artillery range, until, with winter approaching, von Leeb abandoned the attempt to storm the city, and settled down to reduce it by bombardment and starvation. (See Leningrad, Siege of, 1941-44.)

Supply Difficulties

Von Brauchitsch's northern group, therefore, had not reached its objective or achieved the rapid decisive victory hoped for. His centre group, on reaching the Stalin line, encountered fierce opposition. It had to make frequent pauses before it could launch each fresh attack, and Berlin spokesmen complained of the difficulty of maintaining supplies over the indifferent roads. As early as July 11 the Germans claimed to have captured Smolensk, but not till Aug. 13 did the Russians admit having evacuated it some days earlier. The German claim on July 21 that the whole Russian army had been split into uncoordinated groups had evidently resulted from wishful thinking. Still von Bock was making progress, especially on his left where, after being checked at Polotsk, he took Vitebsk on July 12 and Nevel ten days later, thus severing a vital line of Russian lateral communications. The capture of Veliki Luki, on the Moscow-Riga rly., Aug. 26, opened

an additional line for advance on Moscow. Von Bock's right had a hard struggle to cross the Beresina and the upper Dnieper, but the capture of the great railway centre of Gomel, E. of the Dnieper, Aug. 21, was an important success. On Sept. 8, however, von Bock suffered a serious setback when Timoshenko launched a determined counter-attack which forced the Germans on to the defensive.

Rundstedt's Advance

Meanwhile, however, Rundstedt, although his initial onslaught had difficulty in crossing the Prut and had hard fighting in Bessarabia, had made great progress owing to the success achieved by his left wing. This, strengthened by Hungary's entry into the war on June 27, had crossed the upper Dniester, turning Budenny's main defensive line on that river, and had gained an important victory at Uman E. of the Bug. Budenny was forced to retreat rapidly to the Dnieper, leaving Odessa to stand a siege. Budenny had a difficult retreat, since his army, most of it cavalry, had little power of delaying German armour in a country that favoured mechanised vehicles. Even on the Bug he could make no prolonged stand, for this line also had been turned, and it was not till he reached the Dnieper that Rundstedt was forced to halt. Although by Aug. 18 he had cleared all territory W. of the river except round Kiev and Odessa, and on Aug. 27 the Russians had withdrawn from Dnepropetrovsk after breaching the dam, it was more than a fortnight before Rundstedt established a footing on the E. bank of the Dnieper at Kremenchug, evacuation of which the Russians announced on Sept. 14. Odessa he had by-passed, leaving a Rumanian army to invest the city, which the Russians ultimately evacuated on Oct. 16.

In front of Kiev the Russians fought with great determination, and it was only after von Bock's right wing struck S.E. from Gomel and Rundstedt drove N.E. from Kremenchug that a pincer movement developed which threatened to envelop Kiev. Budenny had delayed withdrawal too long, and when at last forced to retreat he suffered disastrous defeat, caught in the jaws of the pincers E. of the city, which was captured on Sept. 21. The Dnieper line was thus hopelessly broken and Rundstedt swept on till he captured Poltava. There his centre appears to have halted, for Khar-

kov was not taken till Oct. 24. His right, however, got a footing on the Perekop isthmus and drove along the N. coast of the Sea of Azov, von Kleist's panzer corps taking Rostov Nov. 22, from which city, however, he was thrown out again Nov. 28.

On Oct. 28 Rundstedt forced his way into the Crimea and soon overran the whole peninsula, except the defences of Sevastopol. His left, diverted N.E. towards Kursk and Orel, took Orel Oct. 7, thus affording substantial protection to the right of von Bock's central operations towards Moscow.

Timoshenko's pressure on von Bock (already referred to) continued. With autumn setting in this was a serious reverse for the Germans. Hitler, however, was not to be baulked; preparations for a decisive effort were made, and on Oct. 3 he announced that the offensive would be reopened. It began on the 6th and took the form of central and enveloping attacks. Vyazma in the centre, Briansk on the right, and Kalinin in the N. were captured by the middle of the month. The Russians were hard pressed, but fighting in great depth took place behind the points reached by German armour. Weather, moreover, had already become wintry, and mud was making supply difficult. By the end of Oct. the German centre had reached Mozhaisk, 60 m. from Moscow; and the right had developed a dangerous thrust to Tula, due S. of the capital. But Tula held out, and the Germans were forced to by-pass the place in order to continue their enveloping movement. By the end of the first week of Nov., though bitter fighting continued, little further progress could be made in the mud. On Nov. 10 real winter cold set in, and by the 22nd had hardened the ground and restored the possibility of mobile action.

Offensive Against Moscow

In spite of the sufferings of his troops from the bitter cold, Hitler insisted on using the opportunity. The offensive was again in full blast, not only on the direct line to Moscow, but in wide outflanking movements, especially from the north. Desperate fighting took place in the Kalinin sector, and it was here that the Russians were in greatest danger. But the cold was having its effect on the German troops, who were unprovided with winter clothing, and on their transport. Commanders were compelled to report that

the men had reached the limit of endurance, and on Dec. 7, 1941, the day of Pearl Harbour, Hitler was forced to announce that the offensive had been abandoned. That entailed the immediate retreat of the long pincer arms and a general withdrawal in search of shelter—for exhausted troops a desperate undertaking.

Temporary German Retreat

At the beginning of Nov. Zhukov had taken over command of the whole of the central and N. front, Timoshenko being transferred to the S. front, and Voroshilov and Budenny being given the task of supervising the training of new armies. Hitler's announcement found Zhukov ready; he immediately launched a general counter-offensive, for which he had held in reserve specially trained and equipped Siberian troops. The great German offensive had failed, and the German armies now faced catastrophic disaster.

In the S. von Kleist was forced to retreat with heavy losses to Taganrog. Attempts to capture Sevastopol were brought to a standstill, and on Dec. 30, by an amazing amphibious operation carried out in the midst of a storm, the Russians recaptured Kerch. In the N. the Germans isolated Leningrad on Nov. 11 by the capture of Tikhvin; but on Dec. 8 the Russians recaptured that town, and von Leeb was forced to withdraw to the Volkov river. The precarious supply route across L. Ladoga was reopened and Leningrad was saved from being starved into submission.

On the central front the Germans were in no condition to hold the vigorous Russian attack. Men collapsed from frostbite and much German equipment had to be abandoned. The Russians recaptured one town after another, and only on the direct approach to Moscow was withdrawal carried out in good order and with stiff resistance. By the end of the first week in Jan., 1942, the Germans to the N. of Moscow had been driven back to the approaches to Rzhev after losing Kalinin, Klin, and Volokolamsk. The centre was fighting desperately at Mozhaisk; and the forces in the S. arm of the pincer movement on Moscow (which had by-passed Tula) had retreated more than 150 m., abandoning its grip on Tula and losing Kaluga 50 m. farther W. Farther S. the whole front had been forced back to the approaches

to Orel and Kursk. By that time the impetus of the Russian pursuit had been reduced, partly owing to the efficiency of the German staff in rallying disorganized troops, partly also because the Germans were falling back on their reserve depots and had shortened their lines of supply, while the supply difficulties of the Russians were steadily increasing. An exceptionally cold winter also affected even the suitably clothed Russians, who found little shelter in the country which had been devastated by the retreating Germans. Nevertheless, during Feb. the Russians continued to gain ground, especially between L. Ilmen and the Moscow-Riga rly., where they drove a deep salient into an area weakly held by the Germans owing to lack of rlys. and the sparsely inhabited and marshy nature of the country. This drive actually gained possession of the Moscow-Riga rly. W. of Rzhev, though Rzhev itself remained in German possession, blocking direct rly. communication with Moscow. The salient at its head, however, was a serious menace to German lateral communication between the Leningrad front and Smolensk.

German Methods of Defence

During the spring months the Russians made some further progress, chiefly in this N. salient, where on its right flank the German 16th army was encircled at Staraya Russa, Feb. 24, immediately S. of L. Ilmen, and might have been captured, if a thaw had not given a German force an opportunity to relieve their isolated comrades. At the head of their salient the Russians recaptured Veliki Luki near the crossing of the Riga and Leningrad rlys., although desperate German resistance saved the latter line from interruption. The Russians extended the left flank of their salient more than 60 m. S. of the Riga rly., causing the German front opposite Moscow to become a pronounced salient based on Vyazma, still further restricted by a deep Russian penetration south of Vyazma.

By the end of May, exhaustion and spring mud brought the Russian main counter-offensive to a standstill. Long before then it had been checked on the greater part of the front by the system of defences the Germans had organized. Distances were too great and troops too few to permit of the construction of continuous trench lines like those of the First Great War; the Germans

therefore relied on holding a series of strong points in large towns with good rly. communications to the rear. These towns provided shelter and supply centres and were protected by a zone of defences in considerable depth, consisting chiefly of fortified villages, the whole forming a "hedgehog" for all-round defence. Fortified rly. lines by which reserves could be quickly moved served to check enveloping attacks. Snow and mud prohibited the use of heavy weapons, and lightly armed Russian troops could make no serious impression. Staraya Russa in the N., Rzhev and Gshatsk in the centre, and Briansk, Orel, and Kursk farther S. were main strongholds. Taganrog in the extreme S. formed a pivot to the whole line, while N. of it the built-up area of the Donetz basin lent itself to defence against the counter-attacks of Timoshenko launched after the Russian recapture of Rostov. By the end of Feb. Timoshenko had, however, driven the Germans back across the Donetz on the N. side of the basin.

In S. Russia spring naturally comes earlier and the ground dries more quickly than in the centre and N. As conditions improved there were signs that the Germans were preparing to renew the offensive. To forestall German plans and dislocate their preparations Timoshenko early in May, 1942, launched an offensive on the Kharkov front with considerable initial success, forming a salient S. of the city which threatened important German communications. The Germans reacted quickly, and attacked Timoshenko's S. flank. Very heavy fighting occurred in the Izyum area, and at the end of May Timoshenko was compelled to retreat behind the upper Donetz. The Germans claimed 240,000 prisoners; but they, too, had had heavy losses and, perhaps more important, had been forced to divert troops intended for a projected offensive into Caucasia, which was thereby delayed and weakened.

German Summer Offensive

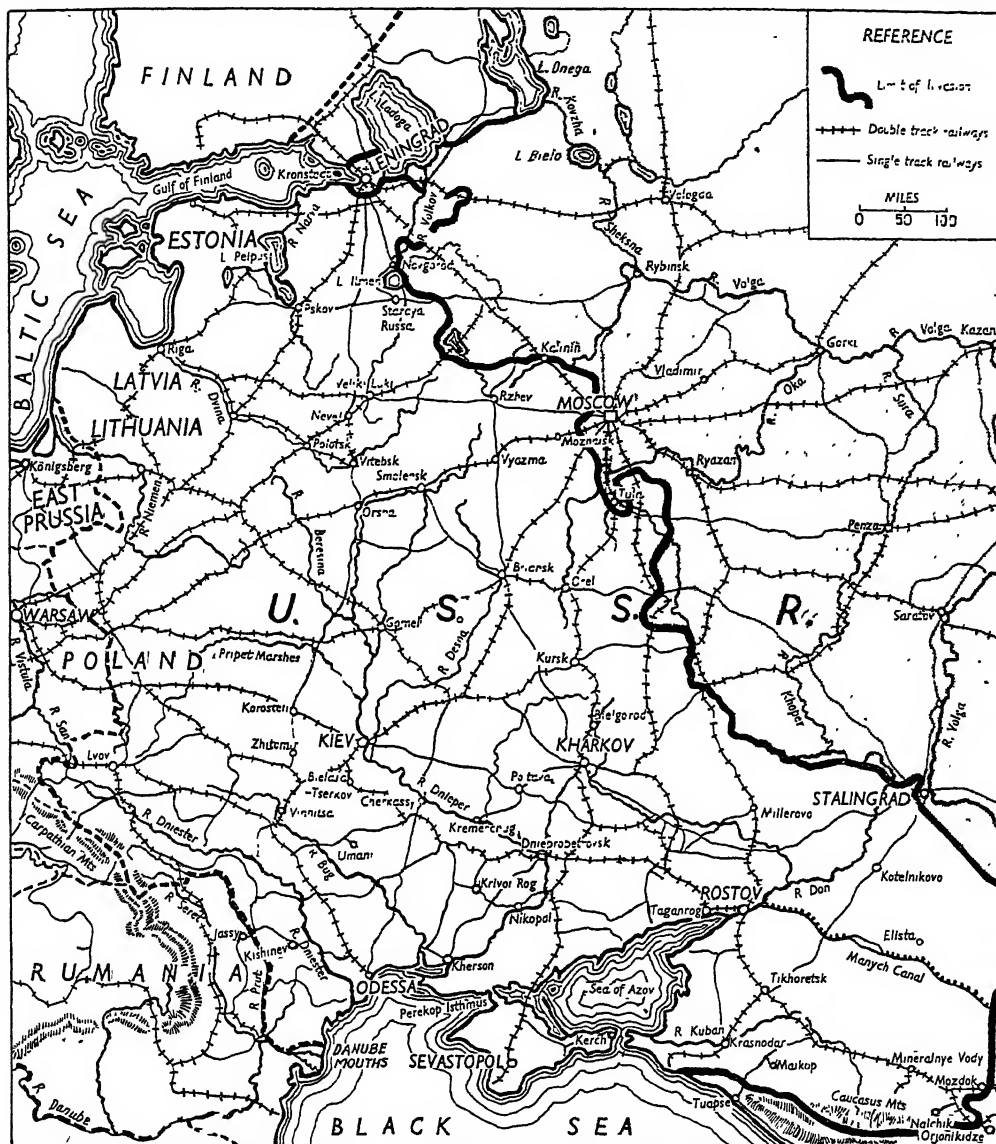
The German summer offensive opened on May 8 with a preliminary operation to regain the Kerch pen. in the Crimea; the Russians admitted they had evacuated it on the 23rd. On June 5 the Germans opened an intensive attack on Sevastopol, with artillery, tanks, and air bombardment. The garrison, besieged already for seven months, resisted until July 3,

when the remains of the garrison were evacuated by the Black Sea fleet. On June 11 the main German offensive opened in the Kharkov region, where the Russians were driven back from the upper Donetz to the line of its tributary, the Oskol. On the Kursk front, a blow aimed against Voronezh on the Don on June 28, gained a foothold in that city, July 6. The Germans extended the breach for 200 m., interrupting all the main lateral communications between Moscow and Rostov, and turning the N. flank of Timoshenko's armies. But desperate attempts by the Germans at Voronezh to enlarge their footing across the Don failed. A drive southward between the Donetz and the Don developed, threatening envelopment of the Russian forces in the S. which, by July 17, had also to meet a major offensive in the Donetz basin, where the Germans had been reinforced by troops released by the fall of Sevastopol.

Russian Rally at the Don

Timoshenko's armies were now in retreat to the lower Don though still successfully resisting continued attacks at Voronezh. The retreat was so rapid that decisive action was evaded, and German pursuit was checked by bridgeheads over the Don in the Tsimlyansk region, which enabled the Russians to rally on the left bank of the river. Retreat from the Donetz basin was not, however, so successfully carried out and there was disorganization which enabled the Germans to capture Rostov, July 27, and deploy on the left bank of the Don. By the end of July they were across the river all the way from Tsimlyansk to its mouth, rly. communication between Stalingrad and N.W. Caucasia being cut near Tsimlyansk. Further retreat to the Caucasus was inevitable; but while the German right and centre had been directed towards the lower Don the left was heavily engaged in the great elbow of the river between Kletskaya and Kalach, where a crossing would uncover Stalingrad. The Russians fought desperately to prevent this and their bridgehead at Kletskaya resisted all attacks; but they lost Kalach Aug. 11.

From the beginning of Aug. the German offensive began increasingly to develop in two divergent directions; on the left towards the Volga at Stalingrad, on the right towards Caucasia. For simplicity the two operations



Russo-German Campaigns. Map showing limits of occupation by Axis armies. State boundaries are those of 1939

will be described separately up to their ultimate failure.

In Caucasia German efforts were at first directed towards the Maikop oilfields, which were quickly reached by a strong armoured column: the Russians evacuated Maikop itself Aug. 16, but not before they had fired the wells. Simultaneously the Germans drove S. from the Rostov bridgeheads to clear the Azov coast; they took the great oil refinery at Krasnodar, Aug. 19, and secured a footing in the foothills on the S. side of the Kuban. The Germans captured

Novorossiisk on Sept. 10, but the Russians clung to the outskirts of the town making the port unusable. An attempt to reach Tuapse by the pass S. of Maikop failed, though in Nov. the Germans captured the pass.

These unsuccessful operations in W. Caucasus possibly diverted strength from the main attack E. towards Grozny and Baku. This began with a rapid drive which met little resistance before Mineralnye-Vody, a spa in the Kuma river area, was captured on Aug. 13, 1942. Then, in spite of

heavy reinforcements, the Germans failed to get beyond Mozdok. As winter approached the Germans tried to get possession of the upper Terek valley and of Orjoni-kidze not only for winter quarters, but because it was the base of a strong Russian force. Early in Nov. by a surprise offensive from the Nalchik area the Germans almost achieved their object, but the Russian defence held and a counter-attack on Nov. 19 drove the Germans back to Nalchik. The lack of decisive success in the Caucasus operations was no doubt

in part due to the demands made by the Stalingrad front. By Aug. 11 that city was threatened from across the Don, at the elbow between Kletskaya and Kalach, and, on the left bank of the river, by a drive from the Tsimlyansk bridgehead which had captured Kotelnikovo. But it was Aug. 24 before the Germans gained a footing across the Don S.E. of Kletskaya. Their capture of Elista, capital of the Kalmuck region, on Aug. 12, seemed to threaten an advance to the lower Volga and Astrakhan. This danger, however, never developed. On Sept. 11 the Germans claimed to have reached the Volga S. of Stalingrad, but by the middle of the month it became apparent that their main effort was being made N.W. of the city. There was fighting in the outskirts of the city by Sept. 16, and by the end of the month in the city itself. Through Oct. and the first half of Nov. the struggle went on, the Germans making steady but slow progress in desperate fighting. In spite of artillery fire and air attacks reinforcements from across the Volga reached the defenders, who, by burrowing in the steep banks of the river, secured bomb-proof cover. Less than one-third of the city, however, remained in Russian hands in a narrow strip along the river, and the final crisis threatened to occur when icefloes made the passage of reinforcements almost impracticable.

Second Winter Campaign

But the situation of the Germans was by no means happy. They had had disastrous losses and become involved in a second winter campaign. Although temps. were not so low as on the Moscow front in the previous winter and the men were more suitably clothed, the wind from the steppes was bitter. Landing grounds available in the summer had for the most part gone out of action; their northern flank was constantly under attack. So great were the demands on troops of the Stalingrad operation and the Caucasus campaign that the holding of the long defensive front on the Don southwards from Voronezh had to be left to troops of doubtful reliability from satellite states. On the Vyazma and other parts of the front the Russians had made dangerous attacks throughout the autumn, and Rzhev was closely threatened.

Then on Nov. 22 a major Russian offensive began on the front between the Volga and the Don

N.W. of the city; and the front was broken simultaneously N. of Kletskaya where Russian armour crossed the Don in a surprise attack and made rapid progress towards Kalach. S. of Stalingrad another surprise attack developed, the Russians there also advancing rapidly towards Kalach. Both the main supply lines of von Paulus's 6th German army were cut. The Russians from outside the city made contact with the garrison within it and von Paulus became engaged in a desperate struggle against the encircling forces. Stalingrad was saved, and the besieging army was threatened with destruction. Attempts were made to supply it by air, and a relieving force was quickly organized at Kotelnikovo. But the German situation rapidly worsened. As the encircling ring closed in supply by air became more difficult and the relieving force, after some initial success, was heavily counter-attacked and driven back to Kotelnikovo which the Russians recaptured Dec. 29. Before that, on Dec. 16, the Russians crossed the middle Don and broke through in a drive that threatened to reach the Donetz and encircle all German troops in the Don bend.

German Withdrawal in Caucasus

By the end of the year the Germans were in retreat to positions where they may have hoped to organize a force to relieve Paulus in the spring. The Russians were checked at Millerovo, E. of the Donetz, and the Germans retreating from Kotelnikovo rallied on the Manych canal. But in the Caucasus they had to withdraw from the Terek valley, hard pressed by a new Russian offensive which started on Dec. 24. During the first week of Jan., 1943, the Russians recaptured Mozdok and Nalchik, and after some hard fighting in the Mineralnye-Vody area the Germans retreated more rapidly as Russian progress on the Manych front threatened to cut them off. Had it not been that Paulus's army continued to engage large Russian forces and to block rly. communication through Stalingrad, this threat might have become more imminently dangerous.

On Jan. 16 a new Russian break through on the Don front S. of Voronezh was announced. This attack fell on a sector held mainly by Italians, and German reinforcements on their way to this part of the front were overwhelmed in the rout. New im-

petus was given to the offensive farther S., and the Germans were forced back across the Donetz. The situation in Caucasia rapidly became critical; the front on the Manych canal gave way, but aided by favourable weather and undamaged communications the Germans just escaped interception on the Baku rly. at Tikhoretsk. They abandoned Maikop Jan. 30 and withdrew the forces threatening Tuapse, the whole Caucasus army, except for a group left in the Kuban to cover the Kerch strait and retain Novorossiisk, retreating through a bridgehead at Rostov. By that time the Russians had recaptured Voronezh on the middle Don (Jan. 25) and overwhelmed the defence on the W. bank, consisting here mainly of Hungarian troops.

During Jan. pressure on Paulus's army had been intensified. On Jan. 22 he refused a demand that he should surrender, but driven into a diminishing area and subjected to intense bombardment, Jan. 31, he capitulated, though part of his army continued to fight until Feb. 2. This disaster marked the turn of the tide in Russia.

No greater stimulant could have been given to the ardour of the Red army. On the Voronezh front they captured Kursk, one of the chief German "hedgehogs," on Feb. 8; farther S., in the upper Donetz basin, they took Bielgorod on Feb. 9. The Russians recaptured Rostov, this time for good, on Feb. 14, and made a deep penetration into the Donetz basin S. of Kharkov which not only threatened that city but endangered communications between the Donbas and the Dnieper.

Recapture and Loss of Kharkov

The Germans had been driven back virtually to the starting line of their previous summer's offensive—and to the W. of Kursk even well beyond it. On Feb. 16 the Russians recaptured the great wrecked city of Kharkov, and, S.W. of it, were thrusting to the Dnieper, having cut all but one of the rlys. leading to the river from the Donbas, where, however, in built-up areas the Germans were fighting fiercely and showed no signs of withdrawing in spite of their perilous situation; for Hitler had not only proclaimed a complete mobilisation of all German resources but had dispatched all available reserves to Russia. These had assembled on the Dnieper, and as the Russian spearhead approached the river it met stiffening

resistance and counter-attacks against its head and its flanks. In the last week of Feb. German counter-attacks developed into a full-scale offensive by some 12 armoured divs. The Russians lost Kharkov on March 15, and Bielgorod on the 21st; but on the middle and upper Donetz they rallied. The Germans made fierce attempts to cross the Donetz, but the Russian defence held, even retaining bridgeheads across the river, while in the eastern Donbas and west of Kursk they lost no ground.

Such was the situation when spring mud brought operations to a standstill. The Russian offensive, in spite of a final reverse, had been an amazing achievement, the result of a daring and successful gamble which counted on living on captured enemy supplies.

The southern counter-offensive had been the main Russian operation of the winter; but other important successes had been achieved. On Jan. 1 Veliki Luki was recaptured and the offensive on the central front continued till the whole of the Vyazma salient was reduced, Rzhev being taken on March 3 and Vyazma on March 12, bringing Smolensk under close pressure. On the N. front Schlusselfurg was recaptured between Jan. 12 and 18, and a substantial corridor was thereby opened to Leningrad, breaking the German line of investment. S. of L. Ilmen, the important hedgehog of Demiansk was recaptured on March 1.

German Counter-Offensives

March 31 marked the end of the winter offensive and the beginning of a long pause, during which both sides reorganized. In the Kursk salient, where it was evident that the clash would occur, the Russians deliberately awaited attack in strongly entrenched positions of great depth, trusting that the enemy would expend his armour in an attempt to break through and thus expose himself to a counter-stroke for which the Russians were husbanding reserves. This plan fully justified itself. On July 5 the Germans opened a double attack from the Orel and Bielgorod fronts on the flanks of the Russian salient, evidently with the intention of pinching it out and recapturing Kursk. The attacks had all the character of a *blitzkrieg*. On the Orel front they employed 7 panzer, 2 motorised, and 11 infantry divs., on the Bielgorod front 10 panzer, 1 motorised, and 7 infantry divs.

The Orel offensive made no material headway, but the Bielgorod offensive penetrated the Russian defences to a depth of 30 m. before it was checked. The issue was critical and the battle raged furiously for more than a week before, on July 12, the Russians opened an offensive against the Orel salient from N. to E. By abandoning their Orel offensive the Germans were able to stave off disaster. It was only by a slow process of attrition that the Russians captured Orel and Bielgorod on Aug. 5, and the Russians' great defensive battle was won when the Germans began to withdraw to their original position. The opportunity had come, and everywhere the Russians turned to the offensive.

Russian Recovery of Donbas

Their forestalling offensive having failed, the Germans had no alternative but to withdraw to the Dnieper. Withdrawal from the Donbas was a critical operation, for the Russians were attacking it from the E., and by Aug. 16 were closing in on Kharkov, from which a threat to the railways leading to the Dnieper might develop. To meet this threat the Germans launched a powerful counter-attack W. of Kharkov which had initial success, but was repulsed on Aug. 23, when Kharkov again passed into Russian hands. About the same time the Russians attacked on the Mius river, which guarded the Azov coast, and on Aug. 30 broke through to capture Taganrog. The situation had therefore become highly critical for the Germans; but by assembling a strong group in the Poltava area they succeeded in protecting the retreat from the Donbas to the strongly fortified Melitopol line which ran from Zaporozhe at the bend of the Dnieper to the Sea of Azov. Farther N. their retreat was also skilfully conducted, though they suffered heavy losses in rearguard actions. They failed, however, to hold the line of the Desna, which the Russians forced by a surprise attack, over marshy ground deemed impassable. The Russians took Briansk on Sept. 17, and developed a new thrust still farther N. against Smolensk, from which they forced the Germans on Sept. 25 after their first re-crossing of the upper Dnieper. By the end of the month the Germans were back on the Dnieper all the way from Vitebsk to Zaporozhe, and the only considerable footholds they held E. of the river were the rly. centre of Gomel

and the area covered by the Melitopol line. They had suffered heavy losses in men and material but had escaped catastrophic disaster. The Russians maintained their pressure and were everywhere in close contact, but autumn rains were setting in and the Russians were now operating in country devastated by the Germans, who seem to have expected a respite for reorganization. They showed no signs of abandoning the Crimea, and even though they had lost Novorossiisk on Sept. 16 they still retained a bridgehead in the Taman pen. opposite Kerch.

But no respite was given them. By Oct. 7 the Russians had established small bridgeheads across the Dnieper N. and S. of Kiev and near Kremenchug. In the same week, on the Veliki Luki front, they captured Nevel, thus securing the main rly. from Leningrad to Vitebsk. By crossing the Sozh river they almost encircled Gomel; and they at last forced the Germans to evacuate the Taman pen. They were also developing heavy attacks on the Melitopol line, and these seemed to promise greater success than attempts to exploit the small bridgeheads across the great Dnieper obstacle. On Oct. 13, although the Germans had used three divs. from the Crimea as reinforcements, the Russians entered Melitopol, took Zaporozhe next day, and cut the railway to the Crimea.

Isolation of the Crimea

Then, on Oct. 17, came the totally unexpected news that the Russians had broken out of their Kremenchug bridgeheads and were driving towards the great iron mining and rly. centre of Krivoi Rog. During the week following this thrust made rapid progress, endangering the whole German position in the Dnieper bend. Reacting strongly, the Germans, by stubborn defence and counter-attacks, held up the thrust towards Krivoi Rog, but could not prevent the breach it had made widening to include Dnepropetrovsk, which, after another surprise crossing of the river, the Russians captured Oct. 25. Meanwhile, pressure on the Melitopol line increased, and on Oct. 23 the Russian capture of Melitopol involved the collapse of the whole German position there. Pursuing vigorously, the Russians reached and penetrated some distance into the Perekop isthmus, isolating the Crimea, while the remnants of the German army which had held the Melitopol line took refuge in bridgeheads

opposite Nikopol and Kherson. This was a disaster of the first order, though the Russians wisely left the Crimea until later.

While these events were happening heavy fighting was in progress near Kiev; Kiev itself was captured by a brilliant outflanking movement on Nov. 6, by which time the whole German line on the Dnieper was crumbling.

New Russian Commanders

At this stage it is well to describe the changes that had occurred in the Russian system of command, for whereas, since the summer of 1942 Russian battles had been won or lost anonymously, from now onwards events were increasingly linked to the names of the Russian generals concerned. The system of dividing the whole front into three, and later into two, main sections had been abandoned before the relief of Stalingrad, and h.q. at Moscow, where Vassilievsky was chief of the staff, directly controlled a number of fronts, constituted according to the circumstances. Now, however, the assignment of commands became systematised, and the 1st (Vatutin), 2nd (Koniev), 3rd (Malinovsky) and 4th (Tolbukhin) Ukrainian fronts (or armies) were constantly referred to in communiqués. Later the 1st, 2nd, and 3rd White Russian and the 1st, 2nd, and 3rd Baltic fronts (or armies) came into the picture. It was Vatutin who captured Kiev, and now the eyes of the world were on him. Thrusting W., with his right protected by the Pripet marshes, and repelling counter-attacks on his left, by Nov. 18 he had captured Zhitomir (Nov. 13) and Korosten, on the rly. which had formed the main German lateral line of communication across the marshes. Rokossovsky had meanwhile crossed the Dnieper N. of the marshes, and had had successes in the Gomel region. The great salient Vatutin had formed entailed a threat to the main line of communication through Poland between Germany and the Ukraine. This daring move invited counter-attack, and in a region where the Germans could most rapidly assemble reserves. Von Manstein, now commanding on the S. front, seized the opportunity, and during the second half of Nov. and first half of Dec. launched a series of violent attacks, being constantly reinforced by reserves from Germany and the W. But Vatutin, turning to the defensive and making great use of his artillery, ceded only some 30 m. of ground,

in depth, though he lost Zhitomir and Korosten. This, the most formidable counter-stroke the Germans delivered during their retreat, had exhausted itself by the middle of December. Meanwhile Rokossovsky continued his attacks, taking Gomel on Nov. 26 and establishing a firm footing across the upper Dnieper. Koniev in the Dnieper bend had also maintained pressure with success, though the Germans clung obstinately to a frontage on the middle Dnieper about Kanyevo between Kiev and Cherkassy.

The main Russian winter offensive started on Dec. 14 when the 1st Baltic army (Bagramyan) opened a new offensive on the Nevel front, outflanking Vitebsk. In the western Ukraine, Vatutin on Dec. 24 turned on Manstein's exhausted force, striking in the direction of the Lvov-Odessa railway S. of Vinnitsa. At Vinnitsa, however, Manstein rallied and, counter-attacking strongly, brought Vatutin to a standstill. But with his right and left wings Vatutin struck fresh blows. His right by the middle of Jan., 1944, was threatening to turn the Vinnitsa position to the W., and his left struck S. from Bielaya Tserkov towards Uman, narrowing the German salient at Kanyevo. During the first half of Jan. there was a pause on the Ukraine front, but N. of the Pripet marshes Rokossovsky gained ground, capturing Novo Sokolniki on Jan. 29.

Relief of Leningrad

Much more important, however, was the offensive launched on Jan. 15 by Govorov and Meretskov on the Leningrad front. In a few days they removed the city from danger and restored its communication with Moscow, involving the Germans in a costly retreat to the Estonian and Latvian frontiers N. and S. of Lake Peipus. The Russian pursuit did not exhaust itself till the middle of March, by which time N. of Lake Peipus the Germans were behind the River Narva, and although S. of the lake they held Pskov and a strong position running S. from it to Vitebsk, they had lost virtually the whole Leningrad-Vitebsk rly. and all territory to the east of it, giving the Russians a favourable starting line for operations in the summer.

Meanwhile in the Ukraine it was announced on Feb. 3 that rapid thrusts by Koniev's right and Vatutin's left had encircled ten German divs. near Korsun which had been attempting to withdraw from the Kanyevo salient. Fierce

fighting ensued, during which the Germans made desperate efforts to bring up relief. But the attempt at rescue failed; Korsun was taken Feb. 14, and when the encircled force surrendered on Feb. 18 the relieving force, having suffered heavily, withdrew towards Uman.

While this was happening, the Germans suffered another disaster in the S. On Feb. 6 Malinovsky broke the German Krivoi Rog-Nikopol defence line. Two days later Tolbukhin annihilated the bridgehead garrison E. of the Dnieper at Nikopol, and in co-operation with Malinovsky captured the city itself (which Hitler had ordered to be held at all costs), destroying seven German divs. On Feb. 22 Krivoi Rog was taken; and on the 24th, N. of the Pripet, Rokossovsky stormed Rogachev, one of the German strongholds on the upper Dnieper.

Recapture of Odessa

On March 5 it was announced that Zhukov (relieving Vatutin, who was suffering from an illness that proved fatal) had broken through on a wide front directed towards Tarnopol and cut the Lvov-Odessa rly., thus interrupting the main communications of the Ukraine with Germany and in particular those of the Vinnitsa group. Malinovsky at the same time was driving S. from the Krivoi Rog front, outflanking all German troops holding the lower Dnieper and its tributary the Inguletz. In the centre, on March 10, Koniev, who had extended his front to take over that of Zhukov's left wing, gained a decisive victory at Uman, the Germans for the first time cracking badly when their armour stuck in the mud. Exploiting his victory, Koniev swept on W. and S.W. across the middle Bug (March 15) and upper Dniester, thus separating the Germans opposing Malinovsky on the lower Bug from Manstein's group still fighting hard about Vinnitsa. The former group, their N. flank threatened, fell back rapidly, to a large extent out of control, pursued by Malinovsky who was thus enabled to capture Nikolaev and to close on Odessa. The Germans and Rumanians attempted to take up a position covering that great port, but by a brilliant manoeuvre Malinovsky outflanked it. Giving up the attempt, and evacuating the city in disorder on April 10, the Germans were driven across the lower Dniester.

Koniev meantime crossed the Prut and the Seret, but, hampered by mud and swollen rivers, was

unable to capture Kishinev and Jassy, on which line Kleist, now independently commanding on what had become the Rumanian front, took up a strong position. Malinovsky was also unable to cross the Dniester in strength, though he secured small bridgeheads over it. Meanwhile Zhukov's offensive had continued, and in co-operation with Koniev's right had outflanked the Vinnitsa-Proskurov area, forcing Manstein to withdraw S., though 45,000 of his troops were cut off and completely surrounded in the Skala area. Manstein, however, received reinforcements and began a series of counter-attacks, which not only helped part of the Skala group to escape but by the middle of April had slowed Zhukov down almost to a standstill short of Lvov. The great offensive, which had started in the Kursk salient in the summer of 1943 and continued thereafter with scarcely a pause, had, by the spring of 1944, achieved immense gains but, with ever increasing difficulties of communication, had at last exhausted itself. A long pause for regrouping and reorganization was clearly necessary before the offensive could be resumed. But there remained a postscript. The isolated German force in the Crimea called for liquidation, and Tolbukhin's 4th Ukrainian army had long been preparing for the task. On April 11 it was announced that by a brilliant manoeuvre he had crossed the Sivash swamp and turned the German defences of the Perekop isthmus. From the Kuban, Yeremenko had also gained possession of Kerch.

Storming of Sevastopol

The Germans, after a disorganized flight, rallied to defend Sevastopol, but, after a short pause to bring up heavy weapons, Tolbukhin carried Sevastopol by storm, May 7-9, in a three days' assault and virtually the whole garrison of more than 100,000 was killed or taken prisoner. The rapid fall of the great fortress that had withstood the German siege for eight months, was a disastrous blow to Germany and, as many Rumanian troops were involved, it was a fresh incentive to that country to get out of the war.

As the summer approached it became a matter for speculation where the Russians would resume the main offensive. The Germans appear to have expected it on the Lvov front, and were apparently confident that in the passage way between the upper Dnieper and the Dvina, which was the most prob-

able alternative, their defences were too strong to invite attack. But it was there on June 23 that the blow fell. On the right the 1st Baltic army (Bagramyan) and 3rd White Russian army (Chernyakhovsky) opened the attack and rapidly encircled and captured Vitebsk (June 26) and Orsha (June 27), the main German strongholds. On the left the 1st White Russian army (Rokossovsky), starting a day later, with equal speed took Zhlobin (June 26) on the Dnieper and Bobruisk (June 29) on the Beresina. In the centre the 2nd White Russian army (Zakharov), starting from farther back, also crossed the Dnieper and took Mogilev (June 28). In five days the whole of von Busch's boasted impregnable front had been broken, and the disaster was to become complete. Chernyakhovsky and Rokossovsky had both sent their armour forward to exploit success, and on July 3 Minsk was captured. Von Busch's line of retreat had thus been cut and his whole disorganized army group encircled. Zakharov was given the task of completing its liquidation while Chernyakhovsky continued his advance towards the E. Prussian frontier, and Rokossovsky, on both sides of the Pripiet marshes, made for the Vistula. With the western front now developing in Normandy the Germans were more than ever short of reserves, and it was not till Rokossovsky had reached the Vistula that he encountered opposition he could not overcome. But the Germans were determined to hold E. Prussia at all costs, and when he reached the Niemen Chernyakhovsky met stiffening resistance which, by the middle of July, held him near the frontier. Zakharov also was halted near the S. frontier of E. Prussia. Meanwhile, however, the offensive was extending. Immediately after the capture of Vitebsk Bagramyan turned W. and N.W. to capture Polotsk (July 4) and to cover Chernyakhovsky's right. By the end of July Bagramyan had driven far into Lithuania, cutting the main communications of the Germans in Latvia and Estonia. Farther N. Yeremenko's 2nd and Maslennikov's 3rd Baltic armies had also taken the offensive and had captured respectively Dvinsk (July 27) and Pskov (July 23). N. of L. Peipus Govorov had taken Narva (July 26). With their line of retreat to E. Prussia threatened and their E. defence disrupted, the position of the Germans in the Baltic states had become desper-

ately precarious; but Hitler insisted on their holding on, possibly in hopes of keeping Finland in the war, although the Finns had been driven out of the Karelian isthmus during June and July and were seeking terms of surrender.

In the S. there was an even more important extension of the offensive, for on July 18 Koniev, who had replaced Zhukov, took the offensive on the Lvov front in co-operation with Rokossovsky in his drive to the Vistula. By-passing Lvov, Koniev took Przemyśl (July 28), and by the end of the month had crossed the San and established a bridgehead over the Vistula near to the mouth of that tributary. About the same time Rokossovsky reached the Vistula at Demblin and was closing in on Warsaw at the beginning of Aug. On Koniev's left the 4th Ukrainian army, last heard of in the Crimea and now under Petrov's command, took the offensive in the Carpathian foothills and made gains.

Remarkable German Recovery

But German powers of recovery were still remarkable, and resistance solidified on the Vistula. Koniev's bridgehead over the river came under heavy counter-attacks, and Rokossovsky, though he took Praga, the suburb of Warsaw on the E. bank, failed in attempts to cross the river to Warsaw itself where the Germans crushed the Polish rising in the city by Oct. 3. Thereafter Rokossovsky devoted himself to operations northwards towards the W. Bug; while Chernyakhovsky, towards the end of Oct. resumed, without any major success, his attempt to break into E. Prussia. Thus during the late autumn of 1944 the main Russian offensive by degrees died down. But after the surrender of Finland in Sept. the offensive in the Baltic states developed successfully. Bagramyan reached the Baltic coast, closing all avenues of escape, while Yeremenko, Maslennikov, and Govorov hunted the Germans back to Riga; and, after capturing that city on Oct. 13, bottled the remains of Lindemann's 30 divs. in the Courland promontory, where they had little further influence on the war.

During the summer of 1944 the Bessarabian front remained virtually stabilised with the 2nd and 3rd Ukrainian armies, now commanded by Malinovsky and Tolbukhin respectively, in contact with Kleist's Jassy-Kishinev position and on the lower Dniester. But on Aug. 23, about the time the drive through Poland had be-

gun to lose its momentum, Malinovsky and Tolbukhin took the offensive. In three days' hard fighting Kleist's positions were irreparably broken, and on Aug. 23 King Michael of Rumania, by a *coup d'état* in Bukarest, broke away from the axis. By Aug. 31 Malinovsky, taking the Ploesti oilfields in his stride (Aug. 30) reached Bukarest to support him. Meanwhile Tolbukhin had crossed the lower Danube, and on Sept. 8 forced Bulgaria to declare war on Germany immediately. Advancing W. in three groups, Malinovsky rapidly overran southern Rumania, and on Oct. 6 crossed the Hungarian frontier. Meanwhile Tolbukhin, cooperating with Bulgarian troops, had turned W. to clear the Morava valley, the main avenue of communication for the Germans in Greece and S. Yugoslavia. On Oct. 20 he captured Belgrade, already outflanked in the N. by Malinovsky, whose southern group, continuing its advance into Hungary, on about the same date reached the Danube opposite the mouth of the Drave. Making no attempt to cross the river Malinovsky swung his left northward in order to cut off the Germans in N. Transylvania from Budapest and Bratislava. About the same time Petrov's 4th Ukrainian army seized the passes over the Carpathians in the North. This pincer manoeuvre failed to surround the German group, which retired into Slovakia; but it cut its communication with Budapest, which Malinovsky then attacked from the E. The Germans were determined to hold that city, and reinforced it strongly. Unable to storm its defences, Malinovsky extended his front northward to the elbow of the Danube, cutting the rly. to Bratislava on the N. bank of the river. Then on Nov. 29 Tolbukhin suddenly appeared on the left bank of the Danube where Malinovsky had first reached the river. Taking the Germans by surprise, he forced a crossing brilliantly and immediately fanned out towards the N. and S. ends of L. Balaton. He met a strong German position between the N. end of the lake and Budapest, but in cooperation with Malinovsky forced his way through and, driving N., completed the encirclement of the city and its garrison of over 200,000 men on Dec. 26. Alarmed, not only at the prospect of another major disaster but because the loss of the Danube line opened a new avenue of approach to the southern strongholds which they had hoped to hold as an

inner citadel, the Germans initiated a series of violent attacks which forced Tolbukhin to give ground. These did not, however, save Budapest which after stubborn resistance fell on Feb. 13, 1945. Nevertheless German counter-attacks persisted with a reckless expenditure of reserves until the last week of March, when the progress of the Russian offensive N. of the Carpathians made a German retreat inevitable.

Invasion of E. Prussia

That offensive had been opened by Koniev from his bridgehead on the upper Vistula on Jan. 12, and was taken up two days later by Zhukov, now in command of the Warsaw front, by Rokossovsky striking into southern E. Prussia, and by Chernyakhovsky in the N.E. of that prov. All made sensational progress. By the end of the month Koniev had entered Silesia and crossed the upper Oder; Zhukov, having liberated Warsaw on Jan. 17 and by-passed Poznan, entered Pomerania; Rokossovsky had not only driven deep into E. Prussia but had reached the gulf of Danzig, isolating the whole prov.; and Chernyakhovsky, having broken through the Insterburg gap, was closing in on Koenigsberg (Kalinograd). During Feb. further progress was made, but chiefly it was a matter of consolidating gains and clearing lines of communication. Poznan, which was a serious block on Zhukov's lines of communication, fell on Feb. 23. During March Koniev extended his hold across the upper Oder and encircled Breslau (Wroclau), but Zhukov made no attempt to cross the river, being content to extend his hold on its E. bank and in cooperation with Rokossovsky to round up all German forces in Pomerania, securing possession of the Baltic coast. Rokossovsky captured Danzig on March 30, and, in cooperation with Chernyakhovsky, continued splitting up and annihilating the enemy's armies encircled in E. Prussia.

By the middle of April the time for a final decisive effort had arrived. In the S. Tolbukhin had cleared Hungary and was at the gates of Vienna, while Malinovsky threatened it from the N. and, with Petrov, had driven far into Czechoslovakia, Koniev's left wing cooperating on that country's N. frontier. Vienna fell on April 13, and Tolbukhin advanced up the Danube to meet the Americans. In the north Koenigsberg was taken on April 9, leaving only a

remnant of Germans to be accounted for in the strip of coastal sand dunes. Chernyakhovsky was killed in the Koenigsberg fighting, and Vassilievsky had taken over his command. Then on April 16 Koniev and Zhukov launched their final drive, the former across the Messe towards the Dresden area and Zhukov across the Oder towards Berlin. After three days' hard fighting German resistance broke down and by April 23 Zhukov had entered the outskirts of Berlin, Koniev's right wing cooperating to encircle the city. On the 25th the Russians linked with the Americans at Torgau on the Elbe, and by then a fierce battle of extermination was proceeding in Berlin. On May 2 resistance ceased in Berlin. Rokossovsky had crossed the lower Oder and was advancing along the Baltic coast to link with Montgomery's army. May 5 saw the surrender of all German forces in the N.W. to Montgomery, and two days later Admiral Doenitz signed an act of unconditional surrender to all the Allies.

Russia's share in achieving that result calls for the fullest acknowledgement and is the more amazing in view of estimates of her potentialities in 1941. She received great material assistance from her allies, and in the last year of the war the reopening of the western front was the decisive factor. But if Russia had not engaged and defeated the greater part of the *Wehrmacht* the landings in France might have been a military impossibility. The Battle of Britain in 1940 was temporarily decisive; but had Germany been free to concentrate her war industries on developing air power, as would have been the case if Russia had collapsed, could British industries, harbours, and airfields under persistent air attack have met allied requirements? Russia's refusal to be crushed by initial disasters, and her subsequent development of offensive power, indubitably were the foundations of final Allied victory.

Russo-Japanese War. Conflict which lasted from Feb. 6, 1904, to Aug. 9, 1905, when the Russians agreed to peace, which was signed at Portsmouth, N.H., on Sept. 5. The Japanese had proved their fighting capacity in their victory against China in 1894. China, besides paying an indemnity, surrendered Port Arthur to the Japanese. All the European powers desired this port, and no one dared to take it. Germany, France, and Russia decided that it should be

given back to China—a severe blow to the ambitious Japanese, especially when Russia immediately stepped in and, under the pretext of a 100 years' lease, took possession. Japan in 1903 began to press Russia to leave Manchuria; Russia pushed on the work on her railways, Japan was not deceived, and eventually demanded that Korea should be independent and Manchuria given back to China. No effect being produced, on Feb. 6, 1904, the Japanese ambassador was recalled from Russia, and Japan declared war.

Opening of Hostilities

The total Japanese trained army was about a million men, but the number she could employ in Manchuria and Korea was limited by the oversea communications. Her forces were organized into armies with Oyama as commander-in-chief; the first army, under Kuroki, was for Korea; the second, under Oku, for the Liao-yang peninsula; three other armies were formed later. No Japanese army could move or be supplied without first obtaining command of the sea; so Togo opened the war on Feb. 8 by a surprise torpedo attack on the ships at Port Arthur, severely damaging two Russian battleships and a cruiser. On Feb. 11 and 12 the Russians lost two moreships, by running on their own mines, and their fleet took refuge under the guns of the fortress. Two Russian cruisers at Chemulpo were sunk on Feb. 9, and the Japanese generals were free to develop their strategy.

Kuropatkin, the Russian commander-in-chief, with the 70,000 men then in Manchuria, had taken up a position on the Yalu river, whence he was soon driven by Kuroki's army, which had landed at Chemulpo on May 1. Oku's army, waiting for the result of the Yalu operations, and with its sea communications further assured by the destruction of Admiral Makarov and his flagship, landed on the Liao-tung peninsula, and on May 21 moved S. and defeated the Russians at Nanshan.

On May 6, the viceroy Alexeieff left Port Arthur, leaving Stössel with 47,000 men to defend the place. By early June Kuroki faced the Russians at Feng-huan-cheng; the 2nd army facing N. was ready to move in the direction of Liao-yang; and Nogi, with a 3rd army, was commencing the siege of Port Arthur. The Russians made a determined effort to relieve it, but were driven back by Oku at the battle of Telissu, June 14-15, and the Japanese captured Kai-

ping on July 9. On July 16 the Japanese formed a 4th army under Nodzu to act in the centre, leaving Kuroki to act on the right.

On Aug. 3 the left and centre captured Haicheng, while Kuroki drove the Russians from the Lan Ho. Here was a pause, owing partly to the weather, but mainly to Oyama's hope that Port Arthur, strenuously attacked, would surrender. The Russians, reinforced to 150,000, thus slightly superior in numbers, were about to take the offensive, when the three reorganized Japanese armies attacked them at Liao-yang in an indecisive battle, July 29 to Aug. 3. The Russians fell back to Mukden. Operations again came to a standstill until Kuropatkin resumed the offensive, but he was badly repulsed in the battle of the Sha Ho, Oct. 9-17. In the neighbourhood of Mukden the exhausted armies, awaiting reinforcements, rested until the surrender of Port Arthur on Jan. 2, 1905, after a desperate and continuous siege. Stössel handed over 39,000 prisoners, but the strenuous attacks of the Japanese had cost the Russians nearly 100,000 casualties.

Russian Naval Losses

At sea, Russia's fortunes were disastrous. After months of blockade, the Port Arthur fleet had put to sea on Aug. 10, 1904, and had finally been defeated by Togo. At nightfall the Russians scattered. Some ships returned to port where they were finally surrendered with the fortress, while the remainder were either sunk or forced into neutral ports, where they were interned. On Aug. 14, Kamimura's squadron had defeated the Vladivostok ships, and the Russian flag disappeared from the Pacific. The only Russian hope of obtaining any naval success then lay in Rozhdestvensky's ships, which were making a laborious voyage from the Baltic, but this fleet was destroyed in Tsushima Strait, May 27-28, 1905. Meanwhile Kuropatkin, still superior in numbers, attacked at Heikoutai, Jan. 26 and 27, before Oku's men from Port Arthur could reinforce Oyama. This was an indecisive battle, but enabled Oyama to collect five armies for the great attack on Mukden, now surrounded by 45 m. of Russian defences.

After Mukden and Tsushima, being threatened with internal disorders, the tsar in June accepted the mediation of the U.S.A., and pourparlers were set on foot, but the war drifted on through July, the Russians slowly falling back.

Peace negotiations were opened at Portsmouth, N.H., on Aug. 9, and by the end of the month the main points were agreed on. Russia was to cede the half of Sakhalin annexed in 1875, surrender her lease of the Kwantung peninsula and Port Arthur, evacuate Manchuria, and recognize Japan's sphere of influence in Korea. Peace was signed on Sept. 5. *Consult* The Russian Army and the Japanese War, A. N. Kuropatkin, 1909.

Russo-Turkish Wars. In the two centuries 1677-1878 the following ten wars were waged between Russia and Turkey. (1) The war of 1677-81 resulted in the recognition of Russia's sovereignty over the Cossacks. (2) In 1689 Russia joined Austria, Poland, and Venice in a coalition against Turkey. By the peace of Constantinople, 1700, Azov was ceded to Russia. (3) Turkey attacked Russia in 1710, surrounded a Russian army on the Prut, and regained Azov by the treaty of the Prut, 1711. (4) In alliance with Austria, Russia declared war on Turkey, 1736, but was obliged to make an unfavourable treaty at Belgrade, 1739.

(5) In 1768 Turkey attacked Russia owing to her interference with Poland. Russia gained victories on the Dniester and Prut and in the Crimea, and by the peace of Kuchuk-Kainarji, 1774, compelled Turkey to recognize the independence of the Tartars, to renounce her suzerainty over Caucasasia, and cede to Russia certain ports on the Black Sea and the right of free commercial navigation in Turkish waters. Turkey reformed the government of Moldavia and Wallachia, and granted Russia the right of intervention on behalf of Christians. (6) Turkey, in 1788, again unsuccessfully attacked Russia, with whom Austria was allied, and by the treaty of Jassy, 1782, Russia acquired the Crimea and the Dniester frontier.

(7) Another war began Jan. 7, 1807, mainly as a result of the dismissal by Turkey of the pro-Russian hospodars of Moldavia and Wallachia. Russia occupied these provinces, but the revolt of the janissaries and the consequent palace revolution in Constantinople prevented a settlement. The armistice arranged, Aug. 24, 1807, after the peace of Tilsit, was followed by a renewal of the war in April, 1809, when the Russians advanced into the Balkans, and on Feb. 10, 1811, took Belgrade. By the treaty of Bukarest, May 28, 1812, Turkey ceded parts of Bessarabia and Moldavia to Russia.

but recovered control of Serbia, while pledging herself to respect the rights of the inhabitants.

(8) The Greek War of Independence, and Russia's share in the battle of Navarino, Oct. 20, 1827, brought about another war, April 26, 1828, in which the Russians took Varna and Silistria, and advanced to the neighbourhood of Adrianople. The treaty of Adrianople, Sept. 14, 1829, secured the independence of Greece and the virtual independence of Moldavia and Wallachia, afterwards Rumania, while Russia gained some districts in the Caucasus, and free commercial navigation of the Black Sea. (9) The war of 1853-56 is described under Crimean War.

(10) The last and most important war was occasioned by the atrocities attending the Turkish suppression of a Bulgarian rebellion in 1876. Serbia having declared war against Turkey and being defeated, the tsar, Alexander II, came in on April 24, 1877, and the Russians immediately advanced on Bukarest, crossed the Danube and seized Timova, which gave command of a pass over the Balkans. To prevent their pushing on to Serbia, Osman Pasha, who commanded some 30,000 men at Widin, marched to Plevna (*q.v.*), where he could command the Russian bridge over the Danube. Here he repulsed the Russian attack of July 30, and was besieged for over four months, defeating the Russians in gallant sorties, and was prevented from gaining an overwhelming victory only by the timidity and incompetence of his government, which refused to permit him to take the offensive. Meanwhile Suleiman, with an army of 30,000 men, advanced from S. of the Balkans, attacked the Shipka Pass (*q.v.*), and, after a bloody battle, was repulsed, settling down to hold the S. end of the pass.

As winter approached, the Russians concentrated on taking Plevna, which fell on Dec. 10. Confusion and maladministration thwarted every attempt of the Turkish army, and the Russian troops released by the fall of Plevna were skilfully used by their generals. The Shipka Pass was crossed, Adrianople taken, and by Jan. 30, 1878, the Russian lines stretched from the Black Sea to the Sea of Marmara, thus isolating Constantinople. The next day an armistice was signed, peace being concluded by the treaty of San Stefano (*q.v.*), March 3. See Osman Pasha; Plevna, Siege of; Russia; Turkey.

Rust. In metallurgy, the red or brown product of corrosion of iron. Chemically, it is hydrated ferric oxide, or ferric hydroxide, sometimes with an admixture of ferric carbonate. Iron readily combines with oxygen, and as oxygen is abundant in air and water, iron exposed to it rapidly changes its composition. Dry iron in dry air does not rust. On the other hand, iron immersed in water does not rust so rapidly as when exposed to the air. Pure iron exposed to pure water or pure oxygen does not rust appreciably. Water which falls on the surface of iron takes on a greenish tinge, produced by the combination of the oxygen in the water with the iron; later it assumes the reddish-brown colour of rust. The rust does not stick to

the iron, but is suspended in the water, becoming a coating on the iron only when the water has evaporated. Although rust is iron oxide, rust is not a simple case of oxidation; it is an electrolytic action, the water having in solution an electrolyte; as some parts of the iron are more aerated than others

there is a differential aeration, which causes a differential potential for the passage and deposition of the ferric oxide or hydroxide. That the difference in potential is due to both water and air is proved by the fact that a piece of iron dipping below water always rusts at the surface of the water, where the oxygen and carbon dioxide in the air combine with the water. Iron remains free from rust in an atmosphere containing water vapour, provided the vapour does not condense on the iron. Rusting may be temporarily prevented by coating the iron with paint to exclude from its surface air or water, but the paint must be constantly renewed. Amalgamating chromium with the iron prevents rust, but the process is not applicable to large surfaces.

Rustchuk (Bulg. *Ruse*). Town of Bulgaria. Important as a rly. and road junction, it stands at the confluence of the Lom with the Danube, with Rumania lying opposite, and about 140 m. N.W. of Varna, with which it is connected by rly. Under Turkish rule it was a great fortress, and figured in the wars with Russia. It is the seat of a Bulgarian archbishop and an Armenian bishop, and has a court

of appeal. It was occupied by the Russians, Sept. 8, 1944, after their declaration of war on Bulgaria of Sept. 5. Pop. 49,447.

Rustenburg. Town of the Transvaal, S. Africa. It is 65 m. by rail from Pretoria, under the Magaliesberg Mts., which form an extensive half-circle round it. There are a court house and several churches. A statue of Kruger, by the French sculptor, Achaud, stands in the town hall gardens. The climate is hot, and Rustenburg is a centre for tobacco, orange, and cotton growing. Founded in 1850, it was occupied by the British in June, 1900. Diamonds were found in 1932 in the Zwartdruggens area, near the town. Pop. 9,000.

Rust Fungi (*Uredinales*). Family of plant parasites. A familiar



Rust Fungi. Hawthorn twig attacked by *Raestelia* stage of *Gymnosporangium*

example is the rust of wheat. The vegetative portion of the fungus exists as fine threads traversing the spaces between the host cells. From these, branches enter the cells and feed upon their contents. They produce several kinds of fructification, often on different hosts, which burst through the cuticle

and these forms of the same fungus were formerly considered distinct species. Thus, the pretty little cluster-cups on leaves of the barberry were formerly known to mycologists as *Aecidium berberidis*. They are now known to be a stage in the life-cycle of wheat rust (*Puccinia graminis*).

The spores (aecidiospores) produced on the barberry will not germinate on the barberry, but they will do so on wheat, barley, and rye, when they produce the rust known as *Puccinia graminis*. The spores of the latter, though they produce rust on other wheat plants, when transferred to barberry produce cluster-cups. Another species produces cluster-cups on hawthorn and allied plants, and was known as *Raestelia lacerata*. Its spores germinate on juniper and produce long tongues of jelly known as *Gymnosporangium clavariiforme*, whose spores produce the cluster-cups of hawthorn. Other species exhibit a similar dimorphism.

Rustington. Seaside resort 2 m. E. of Littlehampton, Sussex, England. Of the church the tower and some arches are Norman, while the chancel and other features go back to the 13th cent. Sir Hubert Parry lived and died here.

Rutaceae OR RUE FAMILY. Large family of trees and shrubs (a few herbs), natives of the warm and temperate regions. They have mostly opposite leaves, dotted with glands which often yield strong odours. The flower-parts are in fours or fives, and the fruits are capsules or berries, the latter sometimes very large and juicy, as in the orange, shaddock, and Bombay quince (*Agele*). Well-known genera are *Ruta* (rue), *Citrus* (orange, lemon, lime), *Choisya*, and *Correa*.

Ruth, BOOK OF. O.T. book so named after the chief character in the narrative. A famine compelled Elimelech, an Ephrathite of Bethlehem-Judah, to take his wife Naomi and their two sons to the country of Moab, where one of the sons married Ruth. When Naomi, after losing her husband and her two sons, returned to her own land, Ruth, her daughter-in-law, insisted on going with her. Here a Hebrew named Boaz, accepting the duty of the next-of-kin, married her, and she became the great-grandmother of David. The action is placed in the period of the Judges, and most of the narrative is written in a pure and early style of Hebrew, but the book would seem to have been edited later. The purpose of the story may have been either to emphasise the duty of the next-of-kin to marry a childless widow, or to justify the legitimacy of intermarriage with foreigners. But the character of Ruth has become especially memorable for her disinterested love.

Ruth, GEORGE HERMAN (d. 1948). American baseball player, known as Babe Ruth and considered the greatest exponent of the game. He played for Boston Red Sox, 1914-19, then for New York Yankees, retiring 1935. Known early as a pitcher, Ruth became a celebrated hitter, who made the record aggregate of 714 home runs. He was also a national figure, and a film about his career had just been shown before he died, aged 53, Aug. 16, 1948. See *Baseball* illus. p. 968.

Ruthenia. Name given to a region of Central Europe, formerly part of Austria-Hungary. Ruthenia was the name also of a prov. of Czecho-Slovakia from 1918, sometimes called Sub-Carpathian Russia and Transcarpathian Ukraine. The cession of territory to Russia in 1945 by Czecho-Slovakia and Poland, and by Rumania in 1947, united the area with the Ukraine S.S.R.

The people of the area, called variously Ruthenes, Russianians, Russniaks, and Red Russians, inhabited the former areas of E. and central Galicia, N. and W. Bukovina, and the E. valleys of the Carpathians. The total Ruthenian pop. was 3,800,000.

In a great part of Galicia the Ruthenes, who were a very poor and backward people, formed the mass of the labouring population, and were dominated by the Polish landed gentry of the old Austro-Hungarian empire. They were conquered by Casimir I of Poland about 1350, although many migrated into Hungary.

The Ruthenian Church, the largest of all Uniat Churches, submitted to Rome at the Synod of Brest-Litovsk in 1596, and was extended in 1700 and 1702. It had an archbishop at Lvov, and used the Old Slavonic liturgy. The church was suppressed in Russian Poland in 1873 and in all Ruthenia in 1948.

Ruthenium. One of the rare metallic elements of the platinum group. Its chemical symbol is Ru; atomic weight, 101.7; atomic number 44; electrical conductivity, 16 (silver being 100); crystal form, close-packed hexagonal, with lattice constants $a=2.6984$ and $c=4.2730$; melting point, $2,400^{\circ}\text{C}$. It is hard, brittle, and one of the least fusible of metals, but the most easily oxidised of the group. White in colour, with greyish tinge, it resists acids, but is attacked by fluorine and chlorine. The metal is a powerful catalyst, absorbing gases readily. It was first isolated by Claus in 1845, and occurs in platinum ores of the Urals, hence its name, after Ruthen, Russia, in association with osmium and iridium ores, and in laurite. The chief present-day source is the low-grade copper-nickel ores at Sudbury, Ontario.

Rutherford, DANIEL (1749-1819). Scottish scientist. Born in Edinburgh, Nov. 3, 1749, he graduated M.D. from the university in 1772 with a dissertation establishing the distinction between carbonic acid gas and nitrogen. He was the first to discover that nitrogen was present in the air, and his research provided the basis for later work on the constitution of natural gases. In 1786 he was appointed professor of botany at Edinburgh university and keeper of the city gardens. He died Nov. 15, 1819.

Rutherford, ERNEST RUTHERFORD, BARON (1871-1937). British physicist. He was born at Nelson,



Lord Rutherford,
British physicist

N.Z., August 30, 1871, and educated at state schools there, Canterbury College, Christchurch, and as a scholar at Trinity College, Cambridge (1894-98), where he worked with

J. J. Thomson. Before his arrival in England he had already proved himself an ingenious experimenter by constructing a novel detector of electric waves, which he described in a communication to the Royal Society in 1897. His earliest work on radio-activity, the subject with which his name will always be associated, was done at McGill University, Montreal, where he was professor of physics, 1898-1907. Returning to England to take the chair of physics at Manchester, which he occupied until 1919, he was awarded the Nobel prize for physics in 1908 in recognition of his discoveries in the field of atomic structure. Knighted in 1914, he was in 1919 appointed Cavendish professor of physics at Cambridge, a position he held until his death. In 1923 he was awarded the O.M., and in 1931 he became Baron Rutherford of Nelson. He was president of the Royal Society during 1925-30, and held many important positions in the world of applied science. He wrote several books on atomic structure. He died Oct. 19, 1937, leaving no successor to his title.

Rutherford must be considered one of the greatest physicists of all time; his work on atomic structure revolutionised the outlook of men of science all over the world. The fact that atoms could break down spontaneously was known before his time; but to him is due the suggestion and the demonstration of artificial atomic disintegration. He was an experimenter of the first rank, and he inspired his collaborators and his students with his own enthusiasm. The establishment of the reality of the atomic nucleus, and the consequent parallelism between the solar system and the atomic system, which proved one of the most fruitful ideas in science, was due almost entirely to his imaginative inspiration, and, although the actual discovery was not his, he was the first to suggest the probability of the existence of the neutron. See *Atom*; *Radio-Activity*. Consult Rutherford: Life and

Letters, A. S. Eve, 1939; Man of Power, I. B. N. Evans, 1939.

John Rowland

Rutherford, MARK. Pseudonym of the British novelist William Hale White (1831-1913). Born at Bedford, he was educated for the Congregational ministry, but abandoned that career to earn his living by his pen. Later he became assistant director of contracts under the Admiralty. His early novels, *The Autobiography*



Mark Rutherford,
British novelist

of Mark Rutherford, 1881; *Mark Rutherford's Deliverance* 1885; and *The Revolution in Tanner's Lane*, 1887, though neglected at first, gradually secured recognition for their powerful handling of moral and other problems and revelation of the author's perplexities. He wrote later *Miriam's Schooling*, 1890; *Catherine Furze*, 1894; *Clara Hopgood*, 1896; *Pages from a Journal*, 1900; *More Pages*, 1910. He died March 14, 1913.

Rutherford, SAMUEL (c. 1600-61). Scottish divine. He was born at Nisbet, Roxburghshire, and educated at Edinburgh university, where he became professor of humanity in 1623. A few years later he was deprived of this office, and became a minister at Anwoth, where his attacks on Arminianism caused the high commission at Edinburgh to silence him in 1636; but two years later he was appointed professor of divinity at St. Mary's College, St. Andrews, and in 1651 rector of the university. A prominent opponent of the government, he especially condemned the treaty with Charles II. For this he was deprived of office; and his book *Lex Rex* was publicly burnt by the common hangman. He died March 23, 1661. Rutherford is best known by his letters, first published in 1664. *Consult Lives*, A. Thompson, 1884; R. Gilmour, 1904.

Rutherglen. Royal and mun. burgh of Lanarkshire, Scotland. It stands on the left bank of the Clyde, 2 m. S. of Glasgow, with a station on the Glasgow-London line. The chief buildings are the parish church and the town hall, both modern. Industries in-



Rutherglen arms

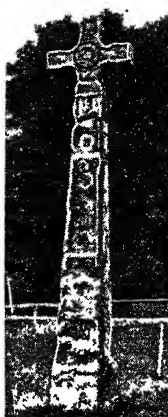
clude the making of chemicals, cotton, paper, pottery, rope, and light engineering products; also dyeing and, formerly, shipbuilding. It was made a royal burgh in 1126, including until 1226 part of Glasgow. It gives its name to a co. constituency. Pop. est. 25,000.

Ruthin OR **RUTHYN.** Mun. borough and market town of Denbighshire, Wales. It stands on the Clwyd, 8 m. by rly. S.E. of Denbigh. S. Peter's church, of the 14th century, has cloisters, and was once collegiate. The grammar school was founded in 1595. A limestone block in the market place is traditionally associated with King Arthur. The town grew up around a castle built by the English in the 13th cent. and known as the Red Castle (Welsh *rhudd din*). Market day, Mon. Pop. 3,690.

Ruthven. Name of a noble Scottish family. Sir William Ruthven was made a peer in 1487. His great-grandson Patrick, the 3rd Lord Ruthven (c. 1520-66), was a leader of the party that slew Rizzio, and he fled to England to escape Mary's vengeance. His son William (c. 1541-84), the 4th lord, arranged the raid of Ruthven, and in 1581 was made earl of Gowrie, but with his attainder and execution in 1584 the titles of the elder branch of Ruthven became extinct. In 1651 Charles II, then in exile, granted the title of Lord Ruthven to Sir Thomas Ruthven, grandson of the 2nd Lord Ruthven, from whom the title has come to the present holder, the 9th baron (b. June 6, 1870), who belongs to the family of Hore-Ruthven. A noted member of the family was Patrick Ruthven (d. 1651), who served under Gustavus Adolphus, and was made earl of Brentford by Charles I. In 1944 the 2nd son of the 8th baron Ruthven was created Viscount Ruthven of Canberra and 1st earl of Gowrie (q.v.). *Pron.* Rivven.

Ruthven, RAID OF. Name given to a plot for the seizure of James VI of Scotland. It was carried out in 1583 by William Ruthven, earl of Gowrie, who, with some associates, induced the king to leave Perth and go to Ruthven Castle, where he remained a prisoner for some months, his captors managing the affairs of the kingdom.

Ruthwell. A village, former burgh, of Dumfriesshire, Scotland. It is 5 m. by rly. W. of Annan. It is famous because of its cross. Dating from the 7th century, this has carvings of the Crucifixion on the front and back and some verses of the extant poem. The Dream of

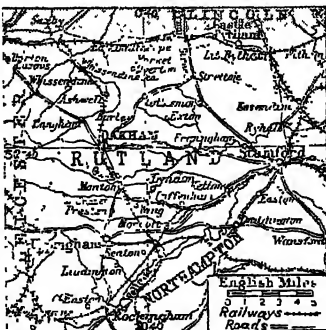


Ruthwell. The 7th century Celtic Cross

the Holy Rood, attributed to Caedmon, in runic letters on the sides. Regarded as a monument of idolatry, the cross was broken by order of the general assembly in 1642, but was restored in 1802.

Rutile (Lat. *rutilus*, reddish). In mineralogy, common crystalline form of titanium dioxide, TiO_2 ; anatase and brookite have the same composition. Rutile occurs as reddish-brown to black tetragonal crystals or grains and is found as an accessory mineral in igneous rocks of many kinds and their metamorphic derivatives. The economically important deposits (see Titanium) are: (a) segregations in igneous rocks, such as asyenite, gabbro, etc., in Virginia, Canada, Norway, and elsewhere; (b) in peculiar pegmatitic dykes with apatite and ilmenite; and (c) as an important constituent of beach sands derived from the weathering of rocks, as in Florida, India, and Australia.

Rutland. County of England, the smallest in the country. Wholly inland, it is bounded by Lincoln-



Rutland. Map of the smallest county of England, with an area of 152 sq. m.

shire, Leicestershire, and Northamptonshire, and has an area of 152 sq. m. It is divided into two parts by the Gwash or Wash, which crosses the county to join the Welland, which forms the S.E. boundary. The upper portion is an elevated plateau; the lower comprises a series of valleys relieved by hills. There are remains of the forest of

Lyfield. An agricultural area, much of the land is permanent pasture; many cattle and sheep are reared, wheat is grown, and cheese is made. Oakham, the birthplace of Titus Oates, is the county town and Uppingham, with its school, is in the county. It is in the diocese of Leicester, and is included in the county constituency of Lincolnshire called Rutland and Stamford. It is a hunting county, the Cottesmore country being in the shire. Pop. 17,401.

LITERARY ASSOCIATIONS. These are connected with distinguished residents rather than natives, though Vincent Wing (1619-68), a celebrated writer on astrology and astronomy, was born at N. Luffenham. Jeremy Taylor was for a few years rector of Uppingham. Abraham Wright (1611-90), a miscellaneous writer, was in his later years vicar of Oakham; his son, James Wright (1643-1713), was a noted antiquary, and wrote a History of Rutland, 1684. Another historian of the co., Thomas Blore (1764-1818), lived for a time at Manton, and published his History of Antiquities of Rutland in 1811. William Whiston (1667-1752), translator of the works of Josephus, died and is buried at Lyndon. Edward Bradley, better known by his pen-name of Cuthbert Bede, was rector of Stretton, 1871-83. The Victoria History of the co. appeared in 1908.

Rutland. City of Vermont, U.S.A., the co. seat of Rutland co. It stands on Otter Creek, 67 m. S.S.E. of Burlington, and is served by the Delaware and Hudson and other rlys. The leading industry is the working of the great marble quarries in the neighbourhood. Settled in 1770, from 1777 to 1791 Rutland was the capital of the independent nation of Vermont. Pop. 17,082.

Rutland, EARL AND DUKE OF. English title borne by the family of Manners since 1525. Before then several princes had been made earl of Rutland, the best known being Richard Plantagenet, who became duke of York, and was the father of Edward IV. His granddaughter married George Manners, Baron Ros, and Thomas Manners was their son.

A prominent courtier, Thomas Manners received from Henry VIII Belvoir Castle and lands in Leicestershire, and was made an earl in 1525. His descendants were important figures in Tudor and Stuart times, especially Henry, the 2nd earl, and Edward, the 3rd earl, both being among Elizabeth's

courtiers and servants. John, the first earl's second son, obtained Haddon Hall by his marriage with Dorothy Vernon, and when the elder line became extinct one of his descendants inherited the earldom, thus bringing Haddon and the Derbyshire estates to it.

John, the 9th earl (1638-1711), was made marquess of Granby and duke of Rutland in 1703, these honours being rewards for his loyalty to Queen Anne. The third duke was the father of the soldier marquess of Granby, whose name is frequently found on inn signs. Charles, the 4th duke (1754-87), was a politician. A close friend of Pitt, he was lord-lieutenant of Ireland. John Henry, the 5th duke, was a society figure, and his younger son was the Tory politician, Lord John Manners, who himself became duke in 1888. His son, who became the 8th duke in 1906, married Violet Lindsay, who, as duchess of Rutland, was a leading figure in London society. The 9th duke made Haddon Hall once more into a family residence. In 1940 Charles John Robert Manners (b. May 28, 1919) became 10th duke. The family estates are in Leics and Derbyshire. Belvoir Castle (*q.v.*) is the duke's chief residence, and the eldest son bears the courtesy title of marquess of Granby.

Rutland, JOHN JAMES ROBERT MANNERS, 7TH DUKE OF (1818-1906). British statesman. Born Dec. 13, 1818, he was educated at Eton and Cambridge. M.P. for Newark, 1841-47, Lord John Manners, who formed one of Lady Blessington's *entourage*, became a prominent member of Disraeli's Young England Party (*q.v.*), and a firm opponent of the Manchester school. Breaking with Disraeli in 1845, he was in Derby's cabinets of 1851, 1858, and 1866, was postmaster-general, 1874-80 and 1885-86, and chancellor of the duchy of Lancaster, 1886-92, succeeding to the dukedom in 1888. Disraeli made him the prototype of Lord Henry Sidney in *Coningsby*, and of Waldershare in *Endymion*. He died Aug. 4, 1906.

Rütli or GRÜTLI. Legendary birthplace of Swiss independence. It is a meadow on the W. shore of the Bay of Uri, Lake of Lucerne, in canton Uri, Switzerland, with a landing-place for steamers from Brunnen to Flüelen. Here, according to a tradition, well known through Schiller's Wilhelm Tell, on Nov. 7, 1307, Stauffacher, Walter Furst, Arnold, Melchtal, and 30 others from Uri, Unterwalden, and Schwyz, swore to drive the

Austrian oppressors from their country, thereby founding the Swiss League. The property of the school children of Switzerland, the spot is marked with commemorative monuments.

Rutting Season. The annual period in the life of many animals. The term is especially used of mature male deer, and applies usually to the autumn, during which they mate with the hinds. At this time a stag will obtain control of a number of females and actively prevent access of other males. Fights may ensue when use is made of the antlers, at this stage fully developed. Such changes in behaviour and form are considered to be controlled by sex hormones.

Ruvigny. Name of a famous French family which settled in England after the revocation of the edict of Nantes. Henri de Massue, marquis de Ruvigny (1605-89), was a soldier who showed marked abilities in Savoy and Lorraine, 1629-30, Italy, 1637, and at Lens, 1648, and was made lieut. in 1652. A Protestant, he was deputy-general of the Huguenots, 1653-78. In 1680 he became naturalised in England, where he had held diplomatic posts, and was a councillor of William III. He died at Greenwich in July, 1689.

His son Henry, born in Paris, April 9, 1648, served in the French army and was engaged in various diplomatic negotiations for Louis XIV. In 1685 he left France, entered the English cavalry, served in Ireland, and was made Viscount Galway in 1692. He fought in Flanders, 1693, Italy, 1694, and was lord justice of Ireland, 1697-1701, being created earl of Galway in 1697. He commanded troops in Portugal and Spain, 1704-07, was ambassador at Lisbon, 1708-10, and died in retirement, Sept. 3, 1720.

Melville Amadeus, 9th marquis de Ruvigny, born in London, April 26, 1868, made a considerable reputation as a genealogist. His many publications included *The Jacobite Peerage*, 1904; *The Blood Royal of Britain*, in several vols., 1903-08; *The Titled Nobility of Europe*, 1914. A legitimist in principle, he was created knight of the order of Charles III of Spain in 1898. He died Oct. 6, 1921.

Ruvo di Puglia (anc. *Rubi*). City of Italy, in the prov. of Bari, 21 m. W. of Bari. It has a curious 12th-13th century Norman cathedral, with gallery and 15th century frescoes. San Giovanni is an old circular baptistry. The Palazzo

Jalta holds a collection of the vases and coins taken from Apulian tombs. The principal occupation is the manufacture of pottery. Pop. est. 24,000.

Ruwenzori. Mountain range of Africa. The peaks lie between Lakes Albert and Edward in the Uganda Protectorate, and have been identified by some with the fabled mountains of the moon of the ancients. The length of the range is about 70 m., with a minimum breadth of about 30 m. The mountains fall steeply on the W. to the Central Rift Valley traversed by the Semliki river. The existence of Ruwenzori was first made known by Stanley during his expedition of 1887-89. The main peaks are Mts. Luigi di Savoia, Baker (15,988 ft.), Stanley (16,815 ft.), Speke (16,080 ft.), Emin (15,797 ft.), and Gessi (15,647 ft.). The Ruwenzori range feeds the four lakes, Edward, George, Albert, and Victoria, as well as the Semliki river which connects Lakes Edward and Albert. On the W. side of the range is the great Ituri forest, the greater part of which is within the Belgian Congo.

Ruysdael, JAKOB IZAAK VAN (c. 1623-82). Dutch painter. Born at Haarlem, he studied surgery as a youth, but took up painting on the advice of Nicolas Berchem. He became a citizen of Amsterdam in 1659, but the proceeds from his art were so poor that he was forced to apply to the Mennonite almshouse at Haarlem. He painted the environs of Haarlem, and romantic woods, streams, waterfalls, and ruins, becoming one of the greatest landscapists of his time. His works are well represented in the National Gallery. He died at Haarlem, March 14, 1682. See Dutch School illus., p. 2879.

Ruyter, MICHAEL ADRIANSZON DE (1607-76). Dutch sailor. He was born at Flushing, March 24, 1607. In 1640 he commanded the Dutch fleet against Spain, whom he defeated at the battle off Cape St. Vincent, Nov. 3, 1641.



M. A. de Ruyter,
Dutch sailor

From 1653 he was engaged in various adventures in the Mediterranean and elsewhere, but the climax of his career was his appointment to command the Dutch fleet which sailed against England in 1666. Defeating Monk off the North Foreland, June 1-4,

he chased the English up the mouth of the Thames. The following year he again entered the Thames, burnt Chatham dockyard, and for a while threatened London. His next engagement of importance was in 1672 in Southwold Bay, where he fought the French and English fleets, but, failing to win a decisive victory, withdrew before he was himself jeopardised. The remainder of his life was spent at sea, in constant battles against the French, in one of which he was mortally wounded off Messina, dying at Syracuse, April 29, 1676. *Consult* Lives, G. Grinnell-Milne, 1896, P. J. Blok, 1933.

Ruzicka, LEOPOLD (b. 1887). Swiss chemist. He was educated at the technical high school, Karlsruhe, and for some years occupied the chair of organic chemistry at the federal institute of chemistry at Zurich. He carried out valuable research work on polymethylenes and the higher terpene compounds, for which he was awarded, jointly with A. Butenandt (*q.v.*), the Nobel prize for chemistry in 1939. In 1942 he became a foreign member of the Royal Society.

Ryan. Loch or inlet on the N.W. coast of Wigtownshire, Scotland. It extends for 8 m. in a S.E. direction from the Firth of Clyde to Stranraer. In width it is from



Ryan. The Scottish loch from the tower of Sheuchan Church, near Stranraer

1½ to 3 m. Oyster culture has been carried on in the neighbourhood.

Ryazan. Town of R.S.F.S.R. and capital of the region of the same name. It stands on the Trubezh, near its junction with the Oka, 120 m. S.E. of Moscow, and is the seat of a Greek Catholic archbishop and an important rly. centre. In the Church of the Elevation of the Cross were buried 16th century princes and princesses of Ryazan. The town trades in grain, cattle, salt, and timber. Pop. 95,358.

Rybinsk. Town of R.S.F.S.R. It is in the region and 50 m. N.E. of Yaroslav, on the Volga and the Yaroslav-Rybinsk rly. There are iron foundries, rope works, and flour mills. Owing to its position at the head of three canal systems, Rybinsk is one of the most promi-

nent river ports in Russia, and is a centre for the caviar industry. Pop. 139,011.

Rydal Mount. Residence at Grasmere, once the home of Wordsworth. It overlooks Rydal Water, and here the poet lived from 1813 until his death, April 23, 1850. See Wordsworth.

Rydal Water. Lakelet of Westmorland, England. It is situated between Grasmere and Windermere, and is 1,000 yds. long and 500 yds. wide. Near the E. end is Rydal village. In the grounds of the nearby Rydal Hall are waterfalls. See Lake District.

Ryde. Mun. bor. and watering-place of the Isle of Wight, England. It stands on the N.E. coast 4 m. S.W. of Portsmouth and 8 m. W. of Newport, and is connected with Portsmouth and other ports by a regular steamboat service. The chief buildings are the modern church of All Saints and the town hall. There are a long pier, excellent sands, and public gardens. The Royal Victoria Yacht Club has a club house here. Until the 19th century Ryde was a fishing village, the name being a corrup-



Ryde arms

tion of La Rye. In 1868 it was made a corporate town. About 2 m. from the town are the ruins of Quarr Abbey, a Cistercian house founded in 1131. The modern abbey belongs to the Benedictines who settled here when expelled from France. Pop. 19,624.

Ryder, CHARLES HENRY DUDLEY (1868-1945). A British surveyor. Born June 28, 1868, he was educated at Cheltenham College and commissioned in the Royal Engineers in 1888. In 1895 he was assistant surveyor to the Mekong boundary commission, and in 1898 was in Yunnan, mapping and reporting on the province. Within a year Ryder covered 1,400 m. of new routes, his work becoming the basis of maps for the survey of India. In 1904 he headed the party sent to

Lhasa to fix the boundaries of Tibet, and later led the expedition that surveyed 40,000 sq. m. between Lhasa and British India, during which the height of Everest was established. Chief surveyor to the Turko-Persian boundary commission of 1913, he drew the frontier from the Persian Gulf to Mt. Ararat. He was surveyor-general in India, 1914, and in the First Great War worked in Mesopotamia (Iraq). Ryder retired in 1924, and died July 13, 1945.

Ryder Cup. Trophy competed for by golf professionals representing Great Britain and the U.S.A. It was presented by Samuel Ryder (d. 1936) of St. Albans. The first match was held in 1927, at Worcester, Mass., and others in each odd-numbered year up to 1937, in the two countries alternately. The series was resumed in 1947. Four foursomes and eight singles are played to decide possession of the cup, which came to Great Britain in 1929 and 1933.

Ryder Memorial Prize. Naval prize founded in memory of Admiral Sir Alfred Phillips Ryder, who died April 30, 1888. It consists of a sum of about £160, the dividend accruing from which is expended annually in purchasing a prize of a book, or books, awarded to the lieutenant in the British navy who takes first place in French at the annual examination in foreign languages.

Rye (*Secale cereale*). Cereal largely grown for grain in North Europe. The so-called "black" bread is made from the flour. In Great Britain it is nearly always cultivated as a forage crop for spring feed. Rye is more tolerant of poor soil than the other cereals. There are summer and winter varieties. The former is sown in spring and matures quickly, though it does not give a large yield. Winter rye, when cultivated as a grain crop, should be put in two or three weeks before wheat, and drilled at the rate of two bushels per acre. The tilling and manuring are as for wheat. It ripens at the end of July or early in Aug. The straw is particularly valuable for thatching, and also makes good litter, but its feeding value is low. Owing to the fact that the grain is liable to be infected with the ergot fungus which can cause abortion, there is some risk in feeding it to pregnant animals.

Rye. River in the N. Riding of Yorkshire, England. It rises in the Cleveland Hills, and takes a S.E. direction for 35 m. to its junction

with the Derwent at Wykeham, 3 m. N.E. of Malton. Rievaulx Abbey stands on the left bank.

Rye. Mun. borough of Sussex, England, one of the Ancient Towns. It is on the Rother, about 2 m. from the coast. By rly. it is 72 m. S.E. of London. The chief objects of interest are the large church of S. Mary, a fine cruciform building, the Ypres



Rye arms

tower built in the 12th century, the Land Gate, and other remains of the fortifications. There are a number of old houses, and the appearance of the town is picturesque. The Mermaid Inn and the old hospital are famous. Pockock's school dates from the 17th century, and there are remains of both a Carmelite and an Augustinian foundation, the former being a small chapel. Some trade is conducted from a harbour on the estuary, and sheep and cattle fairs are regularly held.

Rye was a flourishing port soon after the Norman Conquest. It was governed by a mayor and jurats, retaining its old constitution until 1834. The silting up of the harbour has caused the sea to recede, destroying the commerce of the place. From 1366 to 1885 it was separately represented in parliament. Market day, Wed. (alternate). Pop. 3,947.

Rye Grass (*Lolium perenne*). Perennial grass, earlier known as ray-grass, and useful not only in permanent pasture, but in mixed grass farming. It should be

sown fairly deeply, in April or May, at a rate of 6 lb. per acre. There are five other species, but apart from the native sorts, the Italian varieties are the only ones worthy of consideration. Mixed with clover in the proportion of 25 p.c., rye grass has long been used to make a good pasture for sheep.



Rye Grass. Leaves and flowers

Rye House Plot. Abortive plot to murder Charles II and his brother James, duke of York, in 1683. The name is derived from Rye House, a lonely residence near Hoddesdon, Herts, and the plan was to murder the royal brothers as they returned from Newmarket to London.

Its leader appears to have been an old soldier named Rumbold. Informers gave warning to the authorities, and a number of



Rye House, Herts, from a print of 1781



Rye, Sussex. Mermaid Street, showing the famous Mermaid Inn on left. Top, 14th. cent. Land Gate in the Town wall

arrests were made. Three men were promptly hanged, and four more important persons, Lord William Russell, Algernon Sidney, the earl of Essex, and John Hampden, were arrested and charged with forming a council of six for the purpose of organizing an insurrection, the others

being the duke of Monmouth and Lord Howard. Russell and Sidney were beheaded, Hampden was heavily fined, and Essex committed suicide. Rumbold escaped. Rye House still exists, though fallen into some decay, and spoilt by being exploited as a popular resort, with dance hall, tea gardens, etc., as well as serving as a museum. For many years the Great Bed of Ware, referred to by Shakespeare, was housed here.

Rykov, ALEXEI IVANOVICH (1881-1938). Russian politician. He was born at Saratov, educated at Kazan university, and imprisoned several times for sedition under the tsarist regime. Joining the Bolsheviks in 1905, he was a member of the Politbureau from soon after the 1917 Revolution until 1929. Opposition to J. V. Stalin's policy of full collectivisation then led to his expulsion, but he was quickly readmitted as commissar of posts and telegraphs. Rykov was imprisoned in 1936, suspected of Trotskyist sympathies. Tried next year by the central committee of the party and found guilty of betraying the Communist cause, Rykov was executed on March 15, 1938.

Rylands, JOHN (1801-88). British merchant. Born at St. Helens, Feb. 7, 1801, he was educated



John Rylands,
British merchant

at the grammar school there. In 1819 his father and elder brother founded a cotton manufacturing business at Wigan, in which John soon became a partner. In addition to owning factories where textiles of all kinds were manufactured and prepared, the firm entered business as merchants in Manchester and London. From 1847 John was head of the enterprise until it was made a limited co. in 1873. He helped to finance the Manchester ship canal. Rylands died at Stretford, Dec. 11, 1888.

Rylands Library, THE JOHN. Library in Manchester, erected, equipped, and endowed by Enriqueta Augustina Rylands in memory of her husband (v.s.). Situated in Deansgate, and built in the later Gothic style by Basil Champneys, it was dedicated to the public, Oct. 6, 1899. Of its 300,000 books and MSS., the nucleus was the Althorp Library, among notable additions to which were the 6,000 illuminated and other MSS.

of the Bibliotheca Lundesiana of the earl of Crawford. Upwards of 2,500 volumes in the library were printed before 1501, including 60 Caxtons, 800 Aldines, and many rare editions of the Bible and of Greek and Latin, Italian and English classics, exemplifying the evolution of the arts of printing and binding. See Library.

Rymer, THOMAS (1641-1713). English critic and historian. Born at Yafforth, Yorks, and educated at Sidney Sussex, Cambridge, he was called to the bar, but most of his time was devoted to literature. Criticism of the drama was his chief interest, his works in this connexion being *The Tragedies of the Last Age Considered*, 1678, and *A Short View of Tragedy*, 1693. Rymer's real contribution to posterity is his *Foedera*, a work he compiled after being appointed historiographer to the king in 1692. It is a collection of information regarding leagues and treaties to which England was a party; 15 vols. came out before Rymer died in London, Dec. 14, 1713.

Rymill, JOHN RIDDOK (b. 1905). Australian explorer. Born at Penola, S. Australia, March 13, 1905, he was educated at Melbourne grammar school and then joined his father in managing the family sheep station. Interested in Arctic and Antarctic exploration, he went with the Cambridge university expedition to Canada in 1929, the British Arctic air route expedition to Greenland in 1930-31, and with Watkins to the same country in 1932-33. Leader of the British Graham Land expedition to the Antarctic, 1934-37, he was awarded the founder's medal of the Royal Geographical Society, and in 1939 he received the David Livingstone centenary medal of the American Geographical Society for his contribution to the knowledge of the S. hemisphere. In 1938 he published *Southern Lights*, an account of his discoveries. See Antarctic Exploration, p. 483.

Ryot (Arab. *ra'yat* from *ra'a*, to pasture). Indian occupier of the soil. To Europeans a ryot is a peasant holder of land; the Indian meaning is a subject as distinguished from a noble.

Ryswick, TREATY OF. Treaty which in 1697 ended the European war that had raged since 1689.

Ryswick is a village 2 m. S. of The Hague, where meetings took place between the representatives of France, England, the Empire, and the Netherlands. The treaty was signed Sept. 20, 1697, by England, Spain, and the Netherlands. The emperor refused at first to agree, but on Oct. 30 came into the peace. The treaty was a humiliation for France, as Louis XIV surrendered all he had taken since 1679 except Strasbourg, but including the duchy of Lorraine and fortresses on the Rhine. He recognized William III as king of England, and promised to cease supporting James II. To him, on the other hand, Nova Scotia and Pondicherry were restored.

Ryti, RISTO (b. 1889). Finnish president. From Helsinki university he went in for the law. A deputy from 1919 and a leading member of the Progressive party; he was minister of finance 1921-24, and governor of the bank of Finland 1923-45. Prime minister in 1939, he was next year elected president, and approved of Finland's alliance with Germany against Russia. He resigned in 1944 when accused by the Social Democrats of giving a pledge to Hitler not to make a separate peace. On Feb. 21, 1946, he was sentenced to 10 years' hard labour for having brought Finland into the Second Great War as an ally of Germany, but he was pardoned, for health reasons, in 1949.













Ryton. Urban dist. of Durham, England. It stands on the river Tyne, 6 m. W. of Newcastle, and is served by rly. There are iron and steel works, collieries, and limestone quarries. Pop. 14,204.

Ryukyu. Alternative spelling of the name of the Japanese islands described under Riukiu.

Rzhev. Town of Kalinin region, R.S.F.S.R. Lying 75 m. S.W. of Kalinin, it is built on both banks of the Volga, here 350 ft. wide and navigable. An important junction, it is on the Moscow-Riga rly. Its industries include machinery, saw-milling, leather work, oil pressing, and distilling. Part of the principality of Smolensk in the 12th century, it was divided and ruled separately under independent princes in the 15th century. A centre of heavy fighting in the Second Great War, Rzhev was captured by the Germans in Oct., 1941, during their drive towards Moscow and turned by them into a "hedhog" position. It was retaken by the Russians March 3, 1943, thus removing the last threat to Moscow. Pop. 54,081.



Thomas Rymer,
English author

THE Egyptian hieroglyph (5000 B.C.) corresponding to our letter S was a representation of lotus plants growing from water: . The later hieratic cursive had  simplified this into , in which a shape resembling , the modern w is uppermost. The "w" part was taken over by the Phoenicians, whose letter *shin*, meaning teeth, was simply . The early Greek forms of the letter turned  this on its side, , and later, as so often happened (see B, K, P, R), they reversed it: . From this reversed form was evolved the classic Greek *sigma*, . But other early Greek forms  eliminated the final stroke, ; here is first seen the germ of the formal rounded  Roman S.



In cursive script it was found difficult to join this letter with other letters in rapid writing, and many forms of minuscule were evolved, not always immediately recognizable as s, before printing standardised the minuscule in the simple form of a smaller version of the capital letter. The "long s" found in English printed books of the 17th and 18th centuries, which resembled a letter f with the cross-bar protruding to the left only, was a typographical version of an elongated form of the minuscule, together with its ligature. But note that in the case of a double S it was customary to use the "long S" for the first only of the two letters, a practice still occasionally met with in the handwriting of elderly people.

S Nineteenth letter of the English and Latin alphabets. In reality, a voiceless (sometimes voiced) fricative, it is often called a sibilant from its hissing sound. It has two chief values, one voiceless or hard and sharp, as in *sit*, the other voiced, or soft and flat, as in *his*, *rose*. It also represents *zh*, the French *j*, in *leisure*, *pleasure*, *hosier*, etc., the corresponding hard sound to which is *sh*. This should really be regarded as a separate letter, as it appears in some other alphabets, e.g. Russian and Arabic. *S* always has a hard sound at the beginning of words, but in other positions its value is so irregular that no definite rules can be given. In the termination—*sion*, if a consonant precedes, *sh* is heard, as in *possession*, *mansion* (also in *sure*, *sugar*); if a vowel precedes, *zh* is heard, as in *decision*, *delusion*. *S* is mute in *isle*, *island*, *viscount*, *Carlisle*, *Grosvenor*, the preceding vowel being at the same time lengthened. See Alphabet; Phonetics; Pronunciation; Shibboleth; Sibilant.

Saadabad, PACT OF. Regional agreement concluded in 1934 at Saadabad in Persia between Afghanistan, Iraq, Persia, and Turkey. It provided for political collaboration and consultation and was considered to be the nucleus of a Pan-Islam bloc.

Saadia, BEN JOSEPH (892–941), Jewish rabbi and philosopher. Born in the Fayum, Egypt, he was head of the Talmudic school at Sura near Babylon, where he died. His great object was to reconcile the internal differences of Judaism and to bring it into line with philosophical developments. His works, written in Arabic, include the first attempt at a scientific Hebrew grammar.

Saadists. Egyptian political party formed in 1941. Small but vocal, it was intensely nationalist, with Egyptian neutrality and

control of the Sudan the main planks of its platform. The Saadists gained 124 of 264 seats at elections on Jan. 8, 1945.

Saale. River of Germany, a left bank tributary of the Elbe. It flows from the Fichtelgebirge in Bavaria, in a curving but generally northward course, 266 m. to the Elbe, 25 m. above Magdeburg. It is canalised for 103 m. and leads by canal to Leipzig. Halle is the chief town on its banks.

Saalfeld. Town of Thuringia, E. Germany. It stands on the Saale, 31 m. S.S.W. of Jena, and is a rly. junction. The buildings include a Rathaus in the late Gothic and Renaissance styles, erected 1526–37, and the Gothic church of S. John (1389–1456). The château of Kitzstein and the Hoher Schwarm are supposed to have been built by the pagan chief Samo in 632. The chief manufactures were engineering products, paper, and chocolate up to 1945, when the town came under Russian control. Pop. 27,000.

Saar. German name for the river of France and Germany called in France Sarre. It rises in the Vosges mts. on the W. slope of mt. Donon and flows 152 m. in a general N., then N.E., direction to join the Moselle a few miles above Trèves. It is navigable for 74 m. from Sarreguemines to the Moselle, and is connected by the Saar canal with the Rhine-Marne canal.

Saar Basin (Ger. Saarland). Area of W. Europe. Formerly partly in the Rhine prov. of Prussia, and partly in the Bavarian Palatinate, its German name was then Saargebiet (Saar district). It covers 965 sq. m. and, with 874,450 inhabitants (1946), is one of the most densely populated areas of Europe. Here are valuable coal mines upon the production of which depends the working of the neighbouring Lorraine iron. The dist. is hilly and is traversed by the middle course of the Saar river and three minor tribs.; the highest point, in the N., reaches 1,880 ft. The valleys are fertile and produce grain, vegetables, fruit, and wine. The chief towns of Saarland, engaged principally in the iron, steel, and engineering industries, are Dillingen, Homburg, Neunkirchen, Saarbrücken (v.i.), St. Ingbert, and Völklingen. St. Ingbert has also a glass industry, Mettlach, with the area's big power station, makes ceramics, and Saarlautern makes enamel ware, paper, furniture, etc. The centre of a dense rly. network, the Saar basin is connected by canal with the Rhine-Marne canal, and by the Saar and the Moselle rivers with the Rhine.

Under the treaty of Versailles, the Saar basin was placed under French administration for a period of 15 years to compensate France for losses due to the German occupation of her N.E. coalfield during the First Great War. A plebiscite held under the treaty in 1934 gave a ten to one majority in favour of reunion with Germany, which took place in Jan., 1935. Hitler gave the basin the name Saarland and made it a region of the Reich. In 1940 it became part of the Westmark (q.v.).

During the Second Great War the U.S. 3rd Army reached the Saar river near Merzig on Dec. 1, 1944, and by the 5th had three bridgeheads across it in the Saarlautern area. Beyond the river



Saar Basin. Coal-producing areas are indicated by heavy shading.

lay the strongest part of the Siegfried line defences, the 3rd army's attack upon which was set for Dec. 19. But this plan was upset by the Ardennes counter-offensive of Dec. 16, and it was not until March 13, 1945, that the U.S. 7th and 3rd armies attacked from the Saar bridgeheads, capturing Haguenau the same day, and occupying Saarbrücken and Zweibrücken on March 20. All German resistance ceased on March 25.

After the surrender of Germany, Saarland came into the French zone of occupation. Elections held in Oct. 1947, for a new *Landtag* resulted in an overwhelming victory (411,577 against 37,929) for the parties favouring economic union with France. A new constitution made the Saar an autonomous state, detached from Germany and united economically with France, from April 1, 1948.

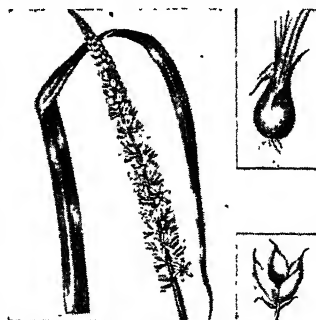
A convention signed March 3, 1950, by France and the Saar laid down the extent of the Saar's authority; it also gave France control of the Saar coalmines until a peace treaty was signed with Germany, and for a total of 50 years if ownership of the mines was in that treaty given to the Saar govt. The Saar became an associate member of the Council of Europe, May 2, 1950.

Saarbrücken (Fr. Sarrebruck). Capital of the Saar Basin (v.s.). From 1381 to 1797 it was the capital of the sovereign county of Nassau-Saarbrücken, later Nassau-Usingen, and went in 1801 to France, in 1815 to Prussia. It stands on both banks of the navigable Saar, is an important rly. junction about halfway between Strasbourg and Trier, Paris and Munich, and the centre of the heavy industry of the Saar. Though for the most part a modern town, it has a church of S. Arnaut (13th century), a Gothic castle church (1476), a town hall and a number of churches of the 18th century, of which that of S. Louis (1762-75) is outstanding. Parts of a palace, likewise of 18th century origin, survived the numerous attacks Saarbrücken has suffered in war, e.g. in 1870, 1914, and 1945. In addition to huge iron and engineering works in the N.W. suburb of Burbach, the town has electrical, piano, paper, leather, cement, sugar, tobacco industries and important schools, museums, libraries, and a theatre; a river port, it had an annual turnover of about 600,000 tons. Pop. (1935) 129,085.

Saaremaa. This is an alternative name for the Baltic island

of Oesel (q.v.), belonging to Estonia S.S.R.

Saarlautern (Fr. Saarlouis or Sarrelouis). Town of Saarland. It was founded as a fortress by Louis XIV in 1681, after Vauban's plans; to it were transferred the inhabitants of the neighbouring Wallerfangen, destroyed to make room for it. It remained a fortress until 1880. On the left bank of the river Saar, it lies at a height of 600 ft. Its walls were well preserved; and so, until damaged in the Second Great War (see Saar Basin), was a town hall with historical tapestries, gifts of Louis XIV. The town was the birthplace of Marshal Ney. It has good schools, museums, a large library, and enamel ware, paper, wood, electrical, brewing, furniture, cement, and brick industries. Though Prussian from 1815, Saarlautern—



Sabadilla. Flower spike and leaf; inset, above, root base; below, single flower

Sarrelibre under the French Revolution—kept stronger sympathies with France than other towns of the Saar basin.

Saavedra Lamas, CARLO DE (b. 1878). Argentinian jurist and statesman. Born June 6, 1878, at Buenos Aires, a great-grandson of Argentina's first president, and grandson of a governor of Buenos Aires prov., he studied and graduated at Buenos Aires university, 1903. Appointed soon after secretary general of the capital's municipality, in 1903 he was elected to parliament, as a Liberal, becoming minister of justice, and of public instruction. Professor of constitutional law at the university of Buenos Aires from 1915, he was leader of the Argentine delegation to the international labour office in Geneva in 1926. As foreign minister, 1932-38, he was instrumental in settling the Chaco War (q.v.); presided, 1935, over the Colombia-Paraguay peace conference at Buenos Aires; and was, 1936, president of the 17th assem-

bly of the League of Nations and of the 1936 Buenos Aires conference of American states (see Pan-American Conference). In 1936 he was awarded the Nobel peace prize. During later political troubles in Argentina he was frequently attacked by fascists, especially in 1944. He wrote a number of books on sociology, international law, etc.

Saba. Island of the Netherlands West Indies. It lies 26 m. S.W. of St. Martin in the Leeward Islands, and is a volcanic peak rising to 2,817 ft. with a total area of 5 sq. m. Coffee and indigo are produced. Pop. 1,194.

Sabadell. Town of Spain, in the prov. of Barcelona. It stands on the Ripoll, a tributary of the Besòs, 14 m. by rly. N.N.W. of Barcelona. There are textile factories, paper mills, and iron foundries. Pop. est. 51,614.

Sabadilla OR CEVADILLA (*Schoenocaulon officinale*). Bulbous perennial of the family Liliaceae. A native of Mexico, it has exceedingly long (18 ins. to 4 ft.), narrow, grass-like leaves, and a long cylindrical spike of tiny yellow flowers. The fruit consists of three papery pouches filled with winged seeds, which yield the drug veratrin or cevadin, a powerful irritant poison. In powder, or as an ointment, sabadilla has been used as a parasiticide.

Sabaeans. Ancient people in S.W. Arabia. The Biblical references, including those of the land of Sheba, have been greatly expanded by modern research. Besides coins and bronzes, thousands of inscriptions in a Phoenician alphabet have been recovered. Speaking a S. Semitic dialect, the Sabaeans settlements in Yemen were engaged in agriculture, mining, and caravan transport. They controlled the gold and spice trade of that region, as described in Isaiah 60, and took toll of early commerce with India and E. Africa. The Biblical account of the queen of Sheba's visit to Solomon puts their activity earlier than the dynastic inscriptions, apparently dating from about 800 B.C. See Himyar.

Sabanalarga OR SABANA GRANDE. Town of Colombia, in the dept. of Atlantico, situated on the Magdalena river, 20 m. S.W. of Barranquilla on the Caribbean coast.

Sabaoth (Heb. *Tsebaoth*, hosts). Term translated in the O.T. (1 Sam. 1, v. 3) as hosts, part of a title of Jehovah. The word Sabaoth is used in Rom. 9, v. 29, and James 5, v. 4. While the phrase Lord of Hosts or Lord of

Sabaoth is taken by some to refer to God as the leader of the armies of Israel, it is more generally regarded as implying the omnipotence of God over all creation, including the angels and the heavenly bodies, *i.e.* the stars, and therefore a warning against star-worship and other forms of idolatry. See Jehovah.

Sabatier, PAUL (1854-1941). French chemist. He was born at Carcassonne, Nov. 5, 1854, and made a detailed study of the problems of catalysis as applied to organic compounds. Professor of chemistry at Toulouse university from 1884, he evolved a method for using finely-powdered nickel as a catalyst for the hydration of various organic substances. This was applied to technical processes, especially the conversion of oleic into stearic acid, in the manufacture of soap. For this work he was awarded, jointly with V. Grignard, the Nobel prize for chemistry in 1912. Sabatier's Catalyse en Chimie Organique became a standard work. He died Aug. 14, 1941.

Sabatini, RAFAEL (1875-1950). British author. Born of Italian and English parentage at Jesi, Italy, he was educated in Switzerland and Portugal, and became a British subject 1918. He was known as a writer of picturesque historical fiction. Among his novels and tales are *The Tavern Knight*, 1904; *Bardelys the Magnificent*, 1906; *Anthony Wilding*, 1910; *The Sea Hawk*, 1915; *Scaramouche*, 1921; *Captain Blood*, 1922; *The Black Swan*, 1932; *Turbulent Tales*, 1946. Several were made into plays and films. Sabatini also wrote a *Life of Cesare Borgia*, 1912; *Torquemada and the Spanish Inquisition*, 1913. He died at Adelboden, Feb. 13, 1950.



Rafael Sabatini,
British author

Sabbath (Heb. *shabbath*, from *shabath*, to desist). In the Jewish religion, the seventh day of the week, kept sacred by worship and cessation of work. In the oldest parts of the Mosaic law, *e.g.* Ex. 23, v. 12, rest on the seventh day is enjoined. The sabbath is repeatedly associated with the festival of the new moon, as in Hos. 2, v. 11; Isa. 66, v. 23; some have thought that it was originally a feast of the full moon, later extended to the four phases of the moon.

The Pharisees, although allowing works of necessity on the Sabbath, interpreted the law in a pedantic spirit which made observance an intolerable burden. Our Lord laid down the principle that the Sabbath was made for man, and not man for the Sabbath (Mark 2, v. 23-3, v. 5). S. Paul treats the keeping of the Sabbath as indifferent (Col. 2, v. 16, etc.). It was, however, observed by many Christians during the first three centuries, in addition to Sunday, which replaced it as a holy day. See Saturday; Sunday; Week.

Sabbatical Year. According to the Mosaic law, every seventh year (Ex. 23; Lev. 25; Deut. 15 and 21; Neh. 10). During this year the land was to lie fallow, spontaneous growth was to be shared with the poor, strangers, and animals; with certain exceptions, debts were to be remitted, and slaves desiring freedom were to be granted it. The harvest of the 6th, *i.e.* the preceding year, would, it was promised, suffice to carry the people over the 7th. The Sabbatical year began and ended on the first day of the 7th month, Tishri, and seven Sabbatical years closed with the year of Jubilee (*q.v.*). The name has been widely adopted in the U.S.A. to denote leave of absence granted every 7th year by many colleges to members of the teaching staff for travel and research.

Sabellianism. Heresy which arose in the latter part of the 3rd century as a result of the teaching of Sabellius. He was a native of Pentapolis, and became a priest at Rome, where he adopted a form of the Noetian heresy and endeavoured to win Pope Zephyrinus (*c.* 198-217) to his side. He taught a form of Unitarianism, maintaining that the Father and the Son are identical, and that the Holy Spirit is simply the energy of the uni-personal God. His teaching had much in common with Monarchianism (*q.v.*), and represented the Trinity as merely a threefold manifestation in action and office of one divine Person. Sabellius was condemned by an early council at Rome, probably about 252, and by several later assemblies of the Church; his heresy became practically extinct in the 5th century.

Sabi. A river of S. Africa. Rising in Mashonaland, it drains the country between Umtali and the Lundi river. From the borders of S. Rhodesia it flows E.N.E. to the Indian Ocean, which it enters 30 m. S. of Chiloane, Mozambique.

In the valley are the Matindela ruins of ancient forts.

Sabine. River of the U.S.A. Rising in the N.E. of Texas, it flows first S.E., and then S., forming the boundary between Texas and Louisiana, through Sabine Lake, 18 m. long and 9 m. broad, into the Gulf of Mexico. It is about 500 m. long, but is navigable for a short way only by small vessels. On Sabine Pass, an excellent harbour at its mouth, is the town and port of entry of Sabine, where a bronze statue of heroic size commemorates the Confederate officer who prevented the invasion of Texas by a Federal army Sept., 1863. Sabine Pass is at the head of the Sabine-Neches waterways, a system of canals making inland towns accessible to merchant craft, opened in 1935 after the removal of a sandbar.

Sabine, SIR EDWARD (1788-1883). British geophysicist and organizer. Born in Dublin in 1788, he was educated at the Royal Military Academy, Woolwich, and saw service with the Royal Engineers in N. America in 1814; promoted gen. in 1870. He acted as astronomer on the Arctic expeditions of Ross and Parry, 1818-20, and undertook magnetic surveys of the British Isles, 1834-36 and 1861. From 1840 he helped to establish the magnetic and meteorological observatories at Toronto, St. Helena, Cape of Good Hope, Hobart, Mauritius, Hong Kong, etc., and to lay the foundations of the Canadian and Indian meteorological services. He initiated pendulum observations of gravity in connexion with the trigonometrical survey of India, started in 1864. Elected a fellow of the Royal Society, 1818, he was president, 1861-71; he acted as gen. secretary of the British Association (president, 1852) 1839-59. He was awarded the K.C.B. in 1869 and died, aged 95, at Richmond, Surrey, June 26, 1883.

Sabines. Ancient Italian people, the ancestral stock of the so-called Sabellians, comprising the Samnites and other central and south Italian tribes. Their earliest home was Amiternum, at the foot of the Apennines, whence they advanced southwards. Early tradition connected them with Rome; the story of the rape of the Sabine women is well known, and Titus Tatius, Sabine king of Cures, is said to have reigned jointly with Romulus. Rome carried on intermittent warfare with the Sabines.

until they were finally subdued by Manius Curius Dentatus, in 290, and admitted to full Roman citizenship in 268.

The country of the Sabines was mountainous and well wooded, suitable for cattle rearing; the inhabitants were hardy, frugal, and pious, and Numa Pompilius, a legendary Roman king of Sabine stock, was the reputed founder of Roman religious institutions. Their language, akin to that of the Samnites, was absorbed in that of Rome, as the people were absorbed. The origin and spread of Sabine tribes, such as the Samnites, Hernicans, and others, is attributed to the ancient Italian custom of the *ver sacrum*, or sacred spring. In times of need the first fruits of spring, including children then born, were dedicated to the gods. When the children grew up, they were expelled from their country to prevent over-population, and bidden to seek a home elsewhere. See Rome; Romulus.

Sable. In heraldry, the technical name for black as one of the tinctures. It is represented in



Sable, in heraldry

drawing by thin vertical and horizontal lines crossing one another. See Heraldry, colour plate; Tincture. **Sable** (*Mus-tela zibellina*). Small carnivorous mammal. It belongs to the weasel tribe, and resembles a marten. It is about 18 ins. long in body; and its fur is of great value for commercial purposes. It was formerly common in N. Asia, but incessant trapping has now restricted its range to the E. districts of Siberia. The name is derived through old French from Slavonic.

Sable (Fr. *sable*, sand). Sandy island in the Atlantic Ocean, belonging to Canada. It lies 104 m. S.E. of Cape Canso, Nova Scotia. The island is crescent-shaped, 20 m. long by 1 m. wide, with an unstable coastline continuously fretted by the sea, and from either end sandbanks extend 20 m. or more. A shallow lagoon, 11 m. long, lies among sandhills, nowhere higher than 80 ft. Lying

in the track of ocean navigation, between Great Britain and America, the island constitutes a most dangerous obstruction, on which more than 200 ships are known to have been wrecked. The Canadian government has planted trees to consolidate the sand and make the island readily visible, and maintains a life-saving establishment.

Sable Antelope (*Hippotragus niger*). Species of antelope. Found in E. and S. Africa, it is notable for its fine horns, 40 to 50 ins. in length. The pelt is glossy black, with white underparts, and white markings on the face. These animals move in herds, and possess great speed and endurance. See Antelope.

Sables-d'Olonne, Les. Town and watering-place of France. In the dept. of Vendée, it lies by the



Les Sables-d'Olonne, France. The harbour, with Tour d'Arundel, used as a lighthouse

Atlantic Ocean on a peninsula, E. of the Point de l'Aiguille. The Gothic church of Notre-Dame-de-Bon-Port was built in the 17th and restored in the 19th century. Other buildings are the casino and a tower, now used as a lighthouse, while there are remains of a castle. Across the harbour lies the suburb of La Chaume, where fishermen live. Fishing, including the cul-



Sable seizing a squirrel among the branches of a tree

ture of oysters, is the main occupation. Salt is obtained from the marshes, but this industry is less profitable than formerly. The town was fortified in the 11th century, and its port built by Louis XI. Pop. 17,650.

Sabot (Fr., wooden shoe). Shoe worn by the poorer classes in France, the Netherlands, and

Belgium. Carved in one piece, the shape varies with the locality. Sabot making is an important trade in parts of N.E. and E. France. See Boots and Shoes, colour plate.

Sabot. Type of artillery projectile. The original sabot was a disk of wood fitted to the base of a cannon ball to prevent gases generated by the explosion of the charge escaping past the projectile. In the Second Great War a sabot shot was developed for anti-tank work. The shell was solid for half its length and had fitted in its head a ballistic cartridge, which exploded the shell after it had penetrated the armoured target.

Sabotage (Fr. *sabot*, wooden shoe). Term originally meaning the infliction of personal violence by kicking. It is now more generally used to describe organized

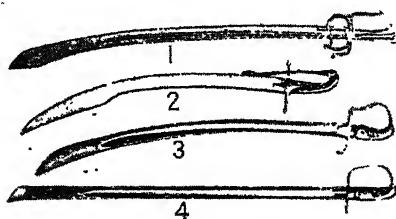
resistance to an unpopular authority. It has been resorted to by discontented workers to achieve their claims by hindering production without involving themselves in the financial penalties of a strike. Sabotage may consist in deliberate damage to machinery, the destruction of manufactured articles, or persistent absenteeism. A more subtle form is to delay production by strict observance of every regulation likely to waste time and labour. In 1887 the French general confederation of labour recognized sabotage as a weapon in industrial disputes, and from France the term passed to Great Britain and the U.S.A., where the Independent Workers of the World used it in their campaign of 1920-22.

During the Second Great War sabotage of factories, premises, stores, and communications was an effective means whereby the subject peoples in the occupied countries fought the Germans. As part of resistance movements, working in cooperation with Allied agents, the workers destroyed factories and machinery, derailed trains, blew up military supply dumps. Within Germany foreign slave labour carried out sabotage. Despite German reprisals, sabotage increased as the war progressed,

and in the Balkans and occupied Russia entire divisions of German troops were required to guard railways and bridges and to protect factories and installations. Outstanding acts of sabotage were the sinking of a ferry carrying the last supplies of heavy water from Norway to Germany, and the destruction of the chief German airfield in Oslo.

Sabrata. Westernmost of the three Roman towns, Sabrata, Oea (near Tripoli), and Leptis Magna, from which Tripolitania, "country of the three cities," gets its name. Sabrata was originally a Punic settlement and submitted to the Romans upon the fall of Carthage. Excavations were carried on by the Italians, who re-erected large parts of a theatre. A British expedition worked on the site from 1914.

Sabre (Magyar *szablya*). Heavy one-edged sword, generally curved towards the point, used by mounted troops. The sabre of the heavy cavalry has a weighty blade, which is almost straight, while that of light cavalry is a lighter and more curved weapon, and that of the horse artillery is still lighter, shorter, and more curved. The regulation British cavalry sabre is a straight blade, 32 ins.



Sabre. 1. Oriental weapon, 16th century. 2. Persian, with Damascus blade. 3. Light cavalry officer's sword, 1815. 4. Heavy cavalry sabre, 1815

long, and weighs 2 lb. The sabre is also used for fencing, especially among soldiers, and sometimes for duelling. See Cutlass; Fencing; Sword.

Sabretache (Ger. *Sabel*, sabre; *Tasche*, pocket). Leather pocket formerly worn by cavalry officers suspended from the sword belt to a distance of 18 ins. It was highly decorated and bore a large representation of the badge of the regiment. It ceased to be worn by British officers on active service in 1880.

Sabu (b. 1924). Indian film actor. Sabu Dastagir, son of Sheikh Ibrahim (employed in the service of the maharaja of Mysore), was born in the Karapur jungle, near Mysore, March 15,

1924. A Muslim, he was brought up as a mahout, and the film director Robert Flaherty, impressed by his

fearlessness, engaged him in 1937 to play the title rôle in *Elephant Boy* (based on Kipling's *Toomai of the Elephants*). Other films of Sabu were *The Drum*, 1938; *The Thief of Bagdad*, 1941; *Black Narcissus*, 1947. During the Second Great War he served in the U.S. army.

Saccharates (Gr. *saccharon*, sugar). Salts of saccharic acid (*v.i.*). There are both normal and acid saccharates, the normal being more soluble than the acid. The name is also applied to compounds more correctly called saccharosates, or sucrosates, which are compounds of cane sugar with various metallic hydroxides, especially those of calcium and strontium, but saccharates of iron, lead, magnesium, sodium, and other metals are known.

Saccharic Acid. Amorphous, deliquescent solid prepared by the acid on sugar, the oxalic acid which is formed at the same time being separated by crystallisation. It was first prepared by Scheele, and is a brittle mass which soon becomes sticky by the absorption of moisture from the air. It is one of the substances giving a

mirror effect when warmed with ammoniacal solution of silver nitrate.

Saccharimeter. Form of polariscope used for determining the amount of sugar in a liquid. The method depends upon the fact that solutions of sugar have the power of rotating the plane of polarisation of light by an amount directly proportional to the quantity of sugar present in a given volume of the liquid through which the light passes (see *Polarisation of Light*). The sugar solution must be clear clarification being effected by means of a solution of lead subacetate or phosphotungstic acid.

Saccharin (Gr. *saccharon*, sugar). Intensely sweet crystalline compound. Discovered by Remsen and Fahlberg at Baltimore



Sabu Dastagir, Indian film actor

in 1879, it is chemically orthobenzoysulphonimide. The various strengths of saccharin may be expressed according to the sweetening power relative to cane sugar, e.g. 300, 450, or 550 times. It is made from toluene by treatment with chlorosulphonic acid. Saccharin replaces sugar in some aerated beverages and for sweetening food for diabetic persons. It possesses antiseptic properties, and is in no sense a food like sugar. During the two Great Wars it came into general use as a substitute. In 1942 saccharin was brought under govt. control by the Saccharin (Control and Maximum Prices) Order. See Sugar.

Sacco-Vanzetti Case. Most notorious murder trial in American history. On April 15, 1920, F. A. Parmenter and A. Berardelli, paymaster and guard of a shoe factory at South Braintree, Mass., were murdered, presumably by thieves who made off with the cash. On May 5, two Italian immigrants, Nicola Sacco (1891-1927), shoemaker, and Bartolomeo Vanzetti (1888-1927), fish pedlar, were arrested. Their trial began on May 31, 1921, before Judge Webster Thayer of the Massachusetts superior court, and on July 14 the jury returned a verdict of guilty. This was strongly contested by many prominent Americans on the ground that the accused had been victimised for their radical opinions and that the procedure of police and court were irregular. Over six years several motions for a new trial were made, but all were refused—even when C. Madeiros, an Italian under sentence of death for another murder, confessed that he had had a hand in the Braintree crime but that neither Sacco nor Vanzetti had been present. An appeal to the U.S. supreme court likewise failed, and on April 9, 1927, Thayer sentenced Sacco and Vanzetti to the electric chair.

A storm of protest was aroused throughout the world, men like Masaryk, A. Einstein and R. Rolland believing that miscarriage of justice had occurred. Nearly a million people signed an appeal to Governor Fuller to exercise his power of clemency, and he appointed President Lowell of Harvard, President Stratton of the Massachusetts institute of technology, and Robert Grant, a former judge, to make an independent investigation. On Aug. 3 Fuller announced that a new trial was not warranted on the evidence; and in spite of more appeals for clemency

or delay to the supreme court, the attorney-general, and President Coolidge, the two Italians went to the electric chair at Charleston on Aug. 23, 1927, both protesting their innocence to the last. There are several books on the case, which is also the basis of Upton Sinclair's novel, *Boston*.

Sacerdos (Lat., priest). General term for any holder of a religious office in ancient Rome. Priests wore a distinctive head-dress, had a place of honour at the public games, were salaried, and exempt from military service and taxation. They only carried out the orders of the senate, and did not take the initiative in any religious act. They usually wore a garland on sacrificial occasions.

Sacerdotalism (Lat. *sacerdos*, priest). Term for the spirit or system of the priesthood. It is used by Protestants and members of the Free Churches to indicate any tendency to over-emphasise the priestly office, particularly in reference to the view that the Holy Eucharist is a sacrifice, and the priest is the minister of that sacrifice.

Sacer Mons (Lat., sacred mountain). Hill on the right bank of the river Anio, about three miles from Rome. It is noted in Roman history as the place to which the plebs made two secessions, 494 and 449 B.C., by way of protest in their struggle for political rights against the patricians. The result of the first was the institution of the tribunes, which the plebeians made a condition of their returning to Rome; by the second, the decemvirs were forced to abdicate. See *Rome*.

Sacharissa. Name bestowed by Edmund Waller upon Lady Dorothy Sidney, eldest daughter of Robert, 2nd earl of Leicester. Waller addressed some of his best poems to her under this name, but while she admired his verses and retained him among her friends, she married Lord Spencer, later 1st earl of Sunderland.

Sacheverell, HENRY (c. 1674-1724). English controversialist. Born probably



Henry Sacheverell,
English
controversialist

at Marlborough, Wilts., son of the rector of S. Peter's, and educated at Marlborough and Magdalen College, he became in 1705 chaplain at S. Saviour's, Southwark. He achieved notoriety with a series of violent pam-

phlets and sermons in support of the High Church and Tory causes. A sermon preached at S. Paul's on Nov. 5, 1709, before the lord mayor and aldermen, drew upon him the wrath of the Whig government. He was impeached, tried in Westminster Hall before the lords, and suspended from preaching for three years, his sermons being burnt by the hangman.

Extraordinary excitement was aroused throughout the country, riots and attacks on meeting houses taking place during the trial, and his light sentence was regarded as a triumph for the High Church and Tory party. Sacheverell was disliked and despised by many of his Tory friends as a man of insolence, mediocre scholarship, and consummate vanity. In 1713 he was given the living of S. Andrew's, Holborn, and he died at Highgate, June 5, 1724. Consult *Bibliography of Dr. Sacheverell*, F. Madan, 1887.

Sachs, FERDINAND GUSTAV JULIUS VON (1832-97). German botanist. Born at Breslau, Oct. 2, 1832, he was educated at Prague, and went, in 1861, to Chemnitz as head of the experimental station, whence he moved to Poppelsdorf. In 1867 he was made professor at Freiburg-im-Breisgau, and in 1868 at Würzburg, where he died, May 29, 1897. Sachs wrote several valuable works on plant physiology, on which his researches were of supreme value. His *Handbook of Botany*, 1868, is a standard work, and like his *History of Botany*, 1875, has been translated into English. *Pron.* Zahx.

Sachs, HANS (1494-1576). German poet and dramatist. He was born at Nuremberg, Nov. 5, 1494, and was early initiated into the art of the Meistersingers (q.v.), in due course becoming one himself, and probably the most prolific of them all. His first poems are said to have appeared when he was twenty. On completing his apprenticeship as shoemaker in his native town, he travelled through Germany, living by his trade of shoemaking but making a name as a singer. He returned to Nuremberg in 1516, and settled there. He died Jan. 19, 1576.

A large part of his poetry was inspired by the Reformation, and

how great his activity was is shown by his having left more than 6,000 separate productions, including 4,275 songs and upwards of 200 pieces in dramatic form, from simple dialogues and Shrovetide plays to comedies and tragedies. Though his poetic gift was not of a high order, his work is of value for its presentation of life in 16th century Germany.

Sack (Fr. *sec*, dry). Name given in the 16th and 17th centuries to a white wine similar to sherry or canary (q.v.). A rough, strong, dry wine, it was commonly sweetened, flavoured with spices, and mulled. The name was used of any white, strong wine from S. Europe.

Sackbut (Fr. *saqueboute*). Musical instrument. It owed its origin, probably early in the 14th century, to the application of the slide mechanism to the buzine or long trumpet. Canon Galpin derives



Sackbut. Musical instrument

the name from the Spanish *sacar*, to draw, and *bucha*, pipe. The sackbut became very popular, and English sovereigns maintained several players of the instrument in their household bands. It was also much used by the watchmen or waits, and at stage plays. Like many other medieval instruments, the sackbut was made in sets. The modern trombone (q.v.) has been developed from the sackbut. The sackbut mentioned in the Book of Daniel, 3, was not a wind instrument, the translators of the A. V. having been misled by the Aramaic word *sabbeka*, which signified a stringed instrument, the *sambuca* of the Romans.

Sackets Harbour. Naval station of the U.S.A. It stands at the E. end of Lake Ontario in Jefferson co., N.Y., and has a rly. station, harbour, and barracks. It sheltered American naval reserves which ultimately enabled the U.S.A. to command traffic in the Great Lakes, British assaults in July, 1812, and May, 1813, having been beaten off. The smallest navy yard in the world, less than four acres, has been maintained there since. For some years the commander was a woman. Pop. 1,962.

Sacking. Coarse cloth for sacks. It is almost invariably made from jute, woven chiefly in Dundee and, under the name of gunnies, in Calcutta. See *Jute*.



Hans Sachs,
German poet

Sack Tree (*Antiaris saccidora*). Tree of the family Moraceae. A native of the East Indies,



Sack Tree. Spray of leaves and flowers; inset, flower-head

it has a tough inner bark from which ropes and matting are made. It is also ingeniously made to yield seamless rice-bags. The trunk is cut in lengths corresponding to the depth of sack required, soaked, and beaten to separate the bark from the wood; then the bark is turned inside out, and the wood sawn off to leave a thin section for the bottom of the sack.

Sackville. Name of a famous English family. The founder of the family fortunes was Richard Sackville, a Kentish landowner, who held office under Henry VIII and was knighted. His son was Thomas Sackville, the poet, made earl of Dorset in 1604. This title, and also that of duke, conferred on Lionel in 1720, were held by members of the family until the death of Charles, 5th duke, in 1843.

The family estates, including Knole Park, passed to the Lady Elizabeth Sackville, later Baroness Buckhurst, a daughter of the 3rd duke, and the wife of earl De la Warr. Her son, Mortimer Sackville-West (1820-1888), was made Baron Sackville in 1876. Lionel Edward (1867-1928), was 3rd baron; his daughter was Victoria Sackville-West (*q.v.*). Charles John Sackville-West (b. 1870), who became the 4th baron in 1928, was a soldier in Burma and South Africa and in the First Great War commanded a brigade. In 1918 he succeeded Rawlinson as British military representative on the Versailles council, received the K.B.E., 1919, and was known, until he succeeded his brother in the title, as Sir Charles Sackville-West. His son and heir, Edward Charles Sackville-West (b. Nov. 13, 1901) was a literary critic who also wrote feature programmes for the B.B.C., *e.g.* The Rescue, 1945.

See Dorset, Earl of; Knole. Consult The Sackville Family, C. J. Phillips, 1930.

Sackville, GEORGE SACKVILLE, 1ST VISCOUNT (1716-85). British soldier and politician, usually known as Lord George Sackville. A younger son of the 1st duke of Dorset, he was born Jan. 26, 1716. Educated at Westminster and Trinity College, Dublin, he entered the army in 1737. He fought at Fontenoy, and in 1758 became commander-in-chief of the British force serving in Germany. He led this at Minden, where he refused to obey the order of his

superior, Ferdinand of Brunswick, who wished the British cavalry to advance. For his action Sackville was dismissed from the service and the privy council, and condemned by a sentence of a court-martial.

After a year or two in retirement he took up political life. Already in the house of commons, and having been under his father secretary of war in Ireland, he became in 1775 a secretary of state, in which capacity he had much to do with directing the war in America. He retired in 1782, and was made a viscount. Sackville, who took the name of Germain on inheriting estates from Lady Betty Germain (d. 1769), died Aug. 26, 1785.

Sackville, LADY MARGARET (b. 1881). English poet, the third daughter of the 7th Earl De la Warr. Her first collection of verse came out in 1901, and was followed by several books of lyrics and ballads, collected in 1939. In 1947 she published *Miniatures*. She



Lady Margaret Sackville, British poet
Elliott & Fry

was temperamentally a romantic, and Romance is the title of one of her best-known poems. She also wrote fairy plays and tales.

Sackville-West, VICTORIA (b. 1892). British writer and poet. Daughter of the 3rd Baron Sackville, she was born at Knole, Kent. Her literary career began with a novel, *Heritage*; then

followed two travel books, *The Road to Teheran*, and *Seducers in Ecuador*. Her novels, *The Edwardians*, 1930, and *All Passion Spent*, 1931, were widely read, and both dramatised. English Country Houses appeared in 1941; *The Eagle and the Dove*, 1943. This poet of great lyrical power won the Hawthornden prize in 1927 with *The Land*; her collected poems appeared in 1933, and *The Garden* in 1946. She married Harold Nicolson (*q.v.*) in 1913, and collaborated with him in an anthology, *Another World Than This*, 1945. She was made C.H., 1948.



Victoria Sackville-West. British writer

Saco. City of Maine, U.S.A., in York co. It stands on the Saco river, 16 m. S.W. of Portland, and is served by the Boston and Maine rly. Near here the river makes a descent of 42 ft., providing abundant water power for the city's industries, among which are the manufacture of cotton, machinery, pumps and sawmill products. Settled in 1630, Saco became a city in 1867. Pop. 8,631.

Sacrament (Gr. *mysterion*, mystery; Lat. *sacramentum*, a sacred thing or an oath). Term which came into ecclesiastical use at the close of the 2nd century for certain doctrines and ceremonies of a sacred character. In the Protestant Churches baptism and Holy Communion are regarded as sacraments; the Roman and Greek Churches include also confirmation, penance, ordination, matrimony, and extreme unction. The Anglican catechism defines the word as "an outward and visible sign of an inward and spiritual grace"; the Roman catechism as "a visible sign of invisible grace instituted for our justification." See Baptism; Communion; Eucharist; Extreme Unction; Ordination; Penance, etc.; consult The Christian Sacraments, O. C. Quick, 1927; Sacraments, A. L. Lilley, 1928.

Sacramentarians. Name applied by the Lutherans to the followers of Zwingli in the Reformation period. Zwingli denied the Real Presence of Christ in the Eucharist, and maintained that the consecrated elements were merely sacramental symbols, and not the immediate vehicle of grace. The term has occasionally been

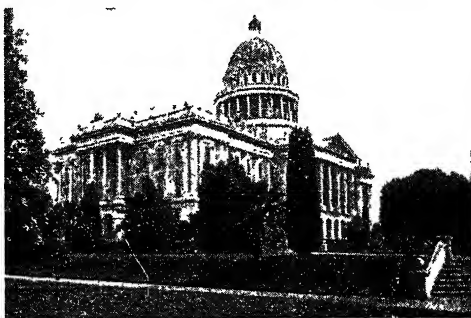
applied by recent writers—with strange confusion of thought—in an exactly opposite sense. See Communion; Zwingli.

Sacramentary (Lat. *Liber Sacramentorum*). Book containing forms of service for use in the administration of the Sacraments, dedication of churches, etc. The most elaborate work of the kind is the Mozarabic, ed. Dom Férotin, 1912. Others are the Roman or Leonine, Gelasian, Gregorian, Gallican, Ambrosian, and Bobbiense. Sacramentaries, superseded by the Missal, Pontifical, and Ritual of the R.C. Church, and the Prayer Book of the Church of England, came into use in the 4th century, the oldest extant example being the Leonine or Veronese, included in Muratori's *Liturgia Romana Vetus*. See Liturgy.

Sacramento. Chief river of California, U.S.A. It rises in the N. part of the state on the W. side of Mt. Shasta, and flows S. and W. to Suisun Bay, about 50 m. above San Francisco, through the N. half of the Great Valley of California. It is about 400 m. long, or 600 m. if Pitt River, its main headstream, which drains Lake Goose in the N.E. part of the state, be included. Navigation is practicable to Red Bluff, 250 m. up the river. See California.

Sacramento. City of California, U.S.A. The state capital and the co. seat of Sacramento co., it stands on the Sacramento river, 88 m. by rly. N.E. of San Francisco, and is served by the Southern Pacific and other rlys. The state capitol is a handsome building erected at a cost of \$500,000. Other prominent buildings are the R.C. cathedral and Crocker Art Gallery. Sacramento contains the state library, with 114,000 volumes. The park system extends to more than 1,000 acres, and in addition there is a large fair ground and racecourse. Among the city's leading industries are flour and grist milling, canning, slaughtering, and meat-packing, iron-founding, and the manufacture of carriages, brooms, pumps, furniture, and soap. It has also extensive rly. repair shops. Large quantities of fruit and grain are grown in the neighbourhood. Settled in 1839, Sacramento was laid out in 1848, and incorporated the following year. It became the state capital in 1854, and was chartered as a city in 1863. Pop. 105,958.

Sacred Heart of Jesus. Festival of the R.C. Church. It is celebrated the 8th day after Corpus Christi (*q.v.*). Arising from revelations made to Marguerite Marie Alacoque (1647-90), a French nun,



Sacramento, California. The state capitol, built in 1869

the Sacred Heart became the object of special devotions throughout the Church. It received official recognition in 1856, when the feast was instituted by Pius IX. The devotion has achieved great popularity in the Roman Catholic Church, and various societies and confraternities have been instituted in connexion with it.

Sacrifice (Lat. *sacer*, sacred; *facere*, to make). In a religious sense, an offering to a divinity, especially at an altar or shrine. The custom is ancient and common to all or most religions. Among the Jews of O.T. times, a sacrifice had three characteristics—it was a means of communion with Jehovah: a gift or tribute; and a means of propitiation or atonement. With the rise of Christianity material offerings were replaced, or believers were enjoined to replace them, by prayer, praise, thanksgiving, a humble and contrite heart, and Christian service, *i.e.* selfless conduct of the individual life. The word is used of the Crucifixion, hence its symbolical application to the Holy Eucharist. In a general sense the word signifies an act of destruction for some particular end, as the sacrifice of a city to prevent its falling into the hands of an enemy; or, in the case of an individual, the giving up of something of value under the compulsion of necessity or the impulse of generosity.

Human sacrifice is a ritual offering of human victims, especially as a propitiation or a vicarious expiation. The term loosely embraces also other forms of immolation, voluntary or involuntary, particularly in association with burial customs. Viewed as ceremonial slaughter—murder or suicide—it is widespread at cultural levels far above primitive savagery, reaching a terrible height of systematisation in 14th and 15th century Mexico. A frequent motive of cannibalism, infanticide, and wife-immolation (*sati*), it finds expression also in foundation sacri-

fices (*q.v.*). Practised by the early Semitic and Aryan peoples, it survives in negro Africa and Polynesia. The Japanese *harakiri* is a voluntary self-immolation at the bidding of loyalty. It is preserved symbolically among many peoples in the form of animal or effigy

sacrifice, and ceremonial blood-letting. See Abel; Abraham; Altar; Atonement; Mosaic. Consult also Primitive Culture, E. B. Tylor, 4th ed. 1903; At the Back of the Black Man's Mind, R. E. Dennett, 1906; The Golden Bough, J. G. Frazer, 1907-15.

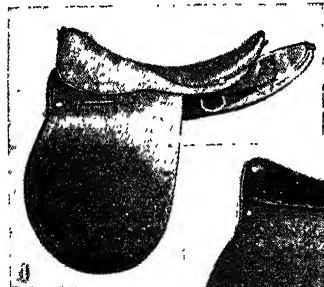
Sacrilege (Lat. *sacer*, sacred; *legere*, to collect, steal). In English law, larceny from a church; and, in ecclesiastical law, the alienation to lay purposes of property given to pious uses. The Larceny Act makes it a felony to break into and enter any church, chapel, meeting-house, or other place of divine worship and commit any felony there, or with the object of committing a felony. It is a like offence for anyone who, having committed a felony in such a place, breaks out. Sacrilege, in the sense of alienating Church property, stands, in law, in no different position from any other alienation of property. If it is a breach of trust it can be restrained, and restitution ordered by the courts.

Sacristan (late Lat. *sacristanus*). Form of the word sexton (*q.v.*).

Sacrum (Lat., sacred, from its use in sacrifice). Triangular-shaped bone formed by the union of five vertebrae. It forms the posterior part of the pelvis and articulates above with the last lumbar vertebra of the spine. The inner or ventral surface of the sacrum is concave, the curvature being greater in the male than in the female, and the width from side to side being greater in the female than in the male. The dorsal surface is convex and very uneven. A cavity in the upper part with a triangular aperture lodges the lower part of the spinal cord.

Sacsahuana. Ancient hill-fort overlooking Cuzco, Peru. Rising 650 ft. above the city, between two deep ravines, it is protected by three parallel walls of cyclopean stonework 600 yards long, with 20 salient and re-entrant angles, built of massive dressed blocks of greyish limestone exactly fitted, without mortar. The lowest wall is 27 ft.

high, with blocks up to 27 ft. by 14 ft. by 12 ft.; the middle wall, 18 ft. behind it on the slope, is 18 ft. high; the uppermost, 9 ft. behind, is 14 ft. high. The space behind each wall was filled in, forming



a terraced platform. Each wall had three gateways, surmounted by monolithic lintels. There are remains of ancient buildings on the summit. The work, apparently pre-Incan, is the greatest mass of megalithic architecture in pre-Columbian America. See Inca.

Sacy, ANTOINE ISAAC SILVESTRE DE (1758-1838). French scholar. Born in Paris, Sept. 21, 1758, he entered the public service in 1781. Devoting himself, however, to the study of Oriental languages, he retired in 1792 and in 1795 became professor of Arabic in the Institute of Oriental Studies. Sacy made himself, by his writings and lectures, one of the foremost authorities on Oriental languages and literature, which studies were greatly fostered by him. He was made a baron and a peer of France, and died in Paris, Feb. 21, 1838. His chief books are translations and editions of Arabic and Persian works, and an Arabic grammar.

His son, Samuel Ustazade Silvestre de Sacy (1801-79), was a noted journalist and critic. He was long connected with the *Journal des Débats*, of which he became editor in 1828. In 1854 he was chosen a member of the Academy.

Saddle. Seat for a rider on horseback. Saddles differ widely in form, but are usually covered with leather and have raised portions at the front and rear. They are padded to span comfortably a horse's back, secured by a girth, and provided with stirrups for the feet of the rider. It is also a pneumatic or leather seat of any of a variety of forms for a rider of a bicycle. As applied to machinery, etc., a saddle is a bridge-piece or carriage made to travel on a guide-

way or bed. Examples are the member carrying the slide or tool-rest of a lathe, a seating for a cylindrical steam boiler, a block over which the cables of a suspension bridge pass, or to which they are anchored, and the bearing of an axle box. See Riding; Saddlery.

Saddleback OR **BLENCATHARA**. Mountain of Cumberland. It is 4 m. N.E. of Keswick, and its altitude is 2,847 ft.

Saddlers' Company, THE. London city livery company. Existing in Anglo-Saxon

ciated with the leather industry. An old one, its prosperity was checked by the great increase in motor traction. Dealers in saddlery are known as saddlers. See Leather.

Saddleworth. Urban district and market town of the W. Riding of Yorks, England. It is on the Tame, 14 m. N.E. of Manchester, and 12 m. S.W. of Huddersfield. It has a rly. station and is on a canal. The chief industry is the manufacture of woollen goods. In the neighbourhood Druidical and other remains have been found. Market day, Wed. Pop. 16,500.

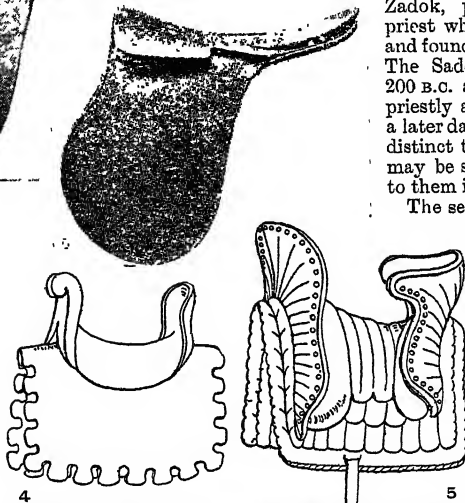
Sadducees. Jewish religious party. It took its name from Zadok, probably the high priest who crowned Solomon and founded a priestly family. The Sadducees arose about 200 B.C. as the party of the priestly aristocracy; but at a later date they came to hold distinct theological views, as may be seen in the allusions to them in the Gospels.

The sect denied the resurrection of the dead and the existence of angels and spirits; and the preaching of the Apostles on the resurrection of Christ aroused their bitter hostility. They also strongly opposed the teaching of the Pharisees respecting the interpretation of the O.T., and maintained that the letter of the law

was sufficient in itself and needed no explanation from tradition or the teaching of the rabbis. The sect disappeared after the final destruction of the Temple. In modern times the Karaites (*q.v.*) may be said to represent them.

Sade, DONATIEN ALPHONSE FRANÇOIS, MARQUIS DE (1740-1814). French writer. Born in Paris, he served in the Seven Years' War, was sentenced to death for immoral practices in 1772, was imprisoned at Vincennes and in the Bastille, and wrote several disreputable romances. He died insane at Charenton, and added the word Sadism (*q.v.*) to the literature of modern psychology. *Pron.* Sahd.

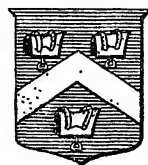
Sa'di, MUSHARRIF UD DIN IBN MUSLHI UD DIN ABDULLAH (c. 1184-1291). Persian poet. A native of Shiraz, he was educated at Bagdad. For 30 years he was a wanderer, travelling to India and Abyssinia, and residing at times in Damascus and



Saddle. 1. Colomal and campaigning pattern. 2. Plain flap hunting saddle. 3. Polo saddle. 4. Roman saddle. 5. German type, 16th century

1-3, by courtesy of Champion & Wilton, London

times as a guild associated with the monastery of S. Martin's-le-Grand, and in the 12th century as a trading colony in West Cheap, its first charter is dated 1272, but it was not incorporated until 1395. Its constitution is more conservative than that of



Saddlers' Co. arms

the city companies, and it still exercises an influence on the saddlery trade, directly and by means of financial support of technical education. The hall, 141, Cheapside, E.C., was built in 1822, the frontal buildings in 1863-64. It was destroyed by German bombs on Dec. 29, 1940.

Saddlery. Term used for saddles, harness, bridles, stirrups, and other accessories of horses and carriages. The trade, of which the English centre is Walsall, is asso-

Jerusalem. He adopted the heretical principles of Sufism (*q.v.*). Settling in Shiraz in 1256, he wrote the *Bustān* or Fruit Garden, a book of ethical and religious verse, which was followed by the *Gulistān* or Rose Garden, his most famous work, in verse and prose mixed, as well as many lyrics of great beauty. Sa'di died Dec. 11, 1291.



Musharrif Sa'di,
Persian poet
From an old print

Sadism. Term used in psychology. A sadist is one who receives sexual pleasure through inflicting physical pain on another. In extreme cases of this psychological maladjustment, it may be that sexual pleasure can be secured only through such infliction of pain. A masochist, on the other hand, derives sexual pleasure from having pain inflicted on himself. The word sadism is derived from the name of the Marquis de Sade (*q.v.*); masochism from that of L. von Sacher-Masoch.

Sadiyā. Village of Assam. It is a frontier station, the farthest Indian post upstream on the Brahmaputra, near the mouths of the Dibang and Lohit tributaries. The town is the head of navigation, and is the terminus of a rly. from Chittagong.

Sadler, Michael Thomas (b. 1883). British biographer. Son of Sir Michael Sadler (*v.i.*), he adopted an older form of the family name. Born Dec. 25, 1888, he was educated at Rugby and Balliol, Oxford. He entered in 1912 the publishing firm of Constable and Co., of which he became director, 1920. He was Sanders reader in bibliography at Cambridge, 1937. His first publication, *The Political Career of R. B. Sheridan*, appeared in 1912, and he wrote on Daumier, 1924; Trollope, 1927 (stimulating a vogue for that novelist); *Bulwer and His Wife*, 1931; *Blessington-D'Orsay*, 1933. Of his novel *Fanny* by Gaslight, 1940, a film version was made.



Sir Michael Sadler,
British educationist

Sadler, Sir Michael Ernest (1861-1943). British educationist. Born at Barnsley, July 3, 1861, he went from Rugby to Trinity Col-

lege, Oxford. Secretary to the university extension committee from 1885, he was appointed in 1895 director of special inquiries and reports to the board of education, a post he retained until 1903. Professor of education at Manchester university, 1903-11, and then vice-chancellor of Leeds, he went back to Oxford as master of University College, 1923-34. He was knighted in 1919, and died Oct. 14, 1943. All forms of education in many parts of the world commanded Sadler's interest. His collection of pictures was exhibited in London, 1944. *Consult* Life, M. Sadler, 1949.

Sadler, Michael Thomas (1780-1835). British social reformer. Born at Snelston, Derbyshire, he was a successful business man in Leeds. He wrote books on social reform, and was a leading member of the group who sought to better the condition of the working classes by Factory



Michael Sadler,
British social
reformer
After W. Robinson

Acts and other legislation. From 1829 to 1832 he was in parliament. He died July 29, 1835. *Consult* Memoirs, R. B. Seeley, 1842.

Sadler or Sadleir, Sir Ralph (1507-87). English diplomatist. Born at Hackney, he obtained the patronage of Thomas Cromwell, and about 1536 entered the service of Henry VIII, who employed him on delicate diplomatic missions to James V of Scotland, made him a principal secretary of state, and knighted him. During the



Sir Ralph Sadler,
English diplomatist

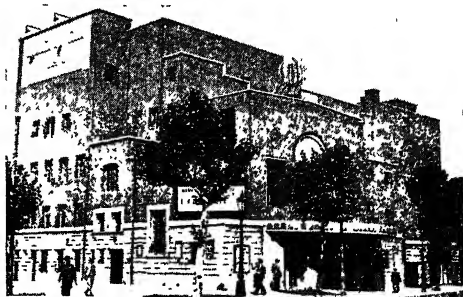
reign of Mary, Sadler as a Protestant retired from public life, but under Elizabeth he became Cecil's most trusted agent in Scottish matters. He was sent on various errands to Mary Queen of Scots, and subsequently served, somewhat unwillingly, as her gaoler in 1580. Sadler died May

30, 1587. His State Papers, edited in 1809 by A. Clifford with a Memoir by Scott, are valuable.

Sadler's Wells. A London theatre, in Rosebery Avenue, Finsbury. It derives its title from a highway surveyor named Sadler, some of whose workmen, digging for gravel here in 1683, discovered "a broad flat stone, supported by four oaken posts, and under it a large well." The water was found to have medicinal qualities, and the place, called New Tunbridge Wells, became both famous and fashionable. Sadler built a wooden music-house or music-hall on the site; this was replaced in 1765 by a regular theatre, which forms part of the building reconstructed from designs by C. J. Phipps, and reopened by Mrs. Bateman in 1879.

Sadler's Wells Theatre had a great vogue, 1844-62, under Phelps, as a home of Shakespearean drama. With it during 1819-28 was associated the name of Grimaldi, and here in 1832 T. P. Cooke achieved great success in Black-Eyed Susan. Later it became a music-hall and then a cinema.

Lilian Baylis, whose successful management of the Old Vic had created an enthusiastic public for serious drama, was the originator of a scheme by which on Jan. 6, 1931, the reconstructed theatre opened with a revival of Twelfth Night by the Old Vic company, and subsequently became the home of opera and ballet (on the latter see also Vic-Wells ballet). On Sept. 7, 1940, the night of the first heavy German air raid on London, the theatre closed and became a rest centre for hundreds of bombed-out families. The building was damaged by bombs but still used during the war as a base for touring companies. Sadler's Wells reopened June 7, 1945, with a performance of Benjamin Britten's opera *Peter Grimes*. See



Sadler's Wells, London. The theatre in Rosebery Avenue, home of opera and ballet

Baylis, Lilian; De Valois, Ninette; Old Vic. *Consult A Theatre for Everybody*, E. J. Dent, 1945; Sadler's Wells Ballet, C. W. Beaumont, 1946.

Sado. Island of Japan. It lies off the W. coast of Honshu, in the Sea of Japan. Formerly constituting a kuni or old prov. of Japan, it was later included in the prefecture of Echigo. Gold and silver are mined, chiefly in the W. near Aikawa, the principal town. Its area is 331 sq. m., and its pop. about 100,000.

Sadoletto, Jacopo (1477-1547). Italian humanist and divine. Born at Modena and educated at Ferrara, where he proved a distinguished scholar in philosophy and the classics, he was ordained priest. Leo X gave him the see of Carpentras, 1517, making him



Jacopo Sadoletto,
Italian humanist

and Pietro Bembo (q.v.) his secretaries. In 1536 Paul III made him a cardinal, and his gentleness, piety, and profound learning proved a considerable asset to the Church, to which he endeavoured to reconcile the Protestant reformers. *Consult S.* on Education, E. T. Campagnac and K. Forbes, 1916.

Sadowa, BATTLE OF. Decisive Prussian victory over the Austrians in the Seven Weeks' War, July 3, 1866. It is sometimes called the battle of Königgrätz. The net result of the brief summer campaign had been the retirement of the Austrian army along the line of the Elbe. The concentrated 1st Prussian and Elbe armies attacked the Austrians at the bridge of Sadowa, near Königgrätz, early on July 3. Pushing forward, they engaged in a furious fight by the bank of the Bistritz and in Maslowed Wood. The Austrians began a slow and ordered retirement, but the arrival of the 2nd Prussian army in the afternoon completed their defeat. By nightfall they had lost 40,000 men, four times the casualties of the Prussians. The numbers engaged were Prussian, 221,000; Austrian, 205,000. *See Königgrätz; Seven Weeks' War.*

Saentis, Sántis, or Hoch-Sentis. Mountain of Switzerland. It is situated on the borders of the cantons of St. Gall and Appenzell, 7 m. S.W. of the town of Appenzell, and has an alt. of 8,215 ft. An observatory and an hotel stand on the summit, which commands

an extensive view. A cable rly. runs to the top.

Safari (Arab. *sefari*, journey). Hunting or shooting expedition by Europeans in Africa. The term is used for any expedition across roadless territory, and includes with the journey the equipment and native porters and bearers.

Safe. Structure, usually portable, for the secure storage of valuables against fire and burglary. Non-portable safes are known as strong rooms and safe deposit vaults, and are nothing more than a strongly constructed part of a building answering the same purposes as a safe on a larger scale.

Safes of various kinds date from pre-Roman times, but it was not until the 18th century that fire-resisting safes were first seriously studied and made. The general principle of the early safe consisted in the construction of two metal walls, the intermediate space being packed with some non-conductor of heat. Plaster of Paris, ground alum and gypsum and various concrete mixtures were used.

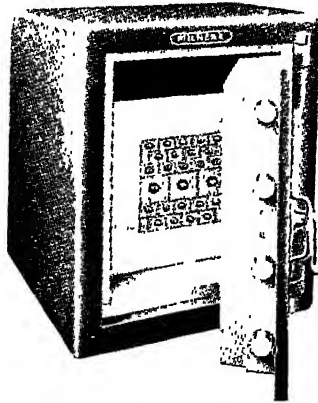
In modern safes the walls are built of sheet iron and steel. Alternate layers are soft and hard, hardness and toughness being the two chief qualities required, one to

made and the use of any disguise, e.g. paint, being avoided. Round doors are often employed for the purpose. The locks of modern safes usually incorporate an anti-explosive device, embodying an independent check that automatically obstructs the sliding bolts should the lock mechanism be displaced. Combination locks can also be fitted. The sliding bolts are operated by a lever handle on the outside face of the door. The great safe deposits and bank vaults are protected by massive doors, and electrical alarms to nearby police-stations. (*See Lock; Strong Room*).

BANK SAFES. Home safes, in which money can be placed until there is sufficient to be taken to a bank, are supplied by the Post Office and by certain banks to applicants. The safes can be opened only by the bank authorities.

In the 1920s and 1930s various British banks introduced automatic safes to enable traders and others who carry on business after banking hours to deposit their money in safety. The idea was borrowed from the U.S.A.

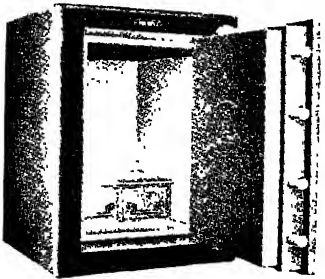
Such a safe is inside the bank building and is connected, by means of a chute, with a fitting built into the outside wall of the bank. Access is gained by a small revolving door in this fitting, the door being controlled by a special key provided by the bank. The customer is also furnished with a leather wallet in which he places cash, cheques, etc. The wallet bears a distinctive number and can be opened only by means of a second special key. After unlocking and opening the revolving door on the outside wall, the cus-



resist cutting tools, and the other the hammering tools or explosives of the burglar.

By another method of construction the outer wall is of cast steel, the inner wall laminated as already described, and the space between filled with insulating material in which are embedded drill-proof steel rods. This construction very effectively resists the action of the oxy-acetylene flame, thermite, etc.

Safe doors are constructed in the best safes so that no join is visible between the door and the safe, the most accurate fit being



Safe. A toughened steel safe so constructed as to withstand fire, damage by falling, and burglary. Left, an insulated safe specially designed for the storage of radium

by courtesy of Milner's Safe Co., Ltd.

tomor places the wallet on a small platform which rotates as the door closes, thus permitting it to travel into the safe. Here it remains until the customer calls during banking hours to pay in the money.

Safe-conduct. In international law, a written permit given by a belligerent to a person allowing him to proceed to a particular place. It is also used of a guarantee of safety given by a military authority to either a neutral or an enemy who is permitted to pass through or into the camp, lines, blockade, or fortress of the authority giving the permission. Such a safe-conduct is always given upon the terms, express or implied, that the person to whom it is accorded will not commit any hostile act (*e.g.* spying), and if he does, he is liable to be dealt with summarily as a military offender.

Safed. Town of Palestine. It lies about 12 m. N. of Tiberias, on the Sea of Galilee. A Jewish tradition survives that the Messiah will appear here. It was fortified by the Crusaders. Pop. 10,900.

Safed Koh. Mt. range of Afghanistan and Pakistan. It forms the watershed between the Kabul and Kurram valleys, and the frontier between Afghanistan and the N.W. Frontier Province. It is snow-capped, with fine coniferous forests on the slopes, and has a general alt. of 12,000 ft., culminating in Sikaram, 15,620 ft.

Safeguarding of Industries Act. Title of two British Acts of parliament, passed 1921 and 1926, designed to foster manufacture in the U.K. of certain goods by imposing a duty on such goods imported from abroad. *See* Protection.

Safety Explosive. General term to define such explosives as may be fired in an explosive mixture of air and gas or coal dust without readily causing ignition of the latter. Every known explosive, if fired in a sufficiently large quantity, will ignite such mixtures, but explosives have been found to differ over very wide limits in the quantity which can be employed without causing ignition, and it is thus possible, by specifying definite conditions under which the test shall be carried out, to define explosives as "safe" or otherwise. Explosives which have passed certain statutory tests for safe use in mines are called Permitted Explosives (*q.v.*).

Safety First. Term used by movement for the prevention of accidents on the road, in industry, and in the home. In 1933 a number of safety-first councils set up in the U.K. in 1916 amalgamated into the national safety first association, which in 1941 became the royal society for the prevention of accidents. Its offices are at 52, Grosvenor Gardens, London, S.W.1.

Safety Fuse. Name applied to a type of fuse employed for firing charges of explosive which can be relied upon to burn at a given rate. It was invented by W. Bickford, a Cornishman, in 1831 *See* Bickford Fuse.

Safety Glass. Glass that does not splinter when broken. Introduced in 1898, it originally consisted of a wire mesh embedded in the glass while the latter was molten. This increased tensile strength and reduced the splintering surface to the area of each mesh. In 1924 an improved safety glass, known as bonded or laminated glass, was introduced by sandwiching a sheet of gelatine or celluloid between two thin sheets of glass, then sealing the edges. Tempered or annealed safety glass was invented in France in the 1930s. A sheet of glass is almost molten, then rapidly cooled on both sides by blasts of air, so that the internal stresses equal the external. Breaking point of annealed glass is 300 p.c. higher than that of ordinary glass. When struck by a blow in excess of its breaking point, it does not splinter, but disintegrates into blunt granules free of cutting edges. Safety glass is chiefly used for the windscreens and windows of motor vehicles. *See* Glass; Laminated Materials.

Safety Lamp. Oil lamp used in coal mines where explosions of firedamp (*q.v.*) may occur. The earliest lamps were invented in 1815 by Davy (*see* Davy Lamp), and George Stephenson perfected a similar lamp, in which the air passed through very narrow metal tubes. The original Davy lamps gave very poor illumination, as the flame was entirely surrounded by iron-wire gauze with 784 apertures per sq. in. In the Clanny lamp the lower part of the gauze was replaced by a glass cylinder, the candle-power being thus much increased. All later designs, Belgian, French, and British, are modifications of the Clanny type. The oil safety lamp is now rarely used for illumination because of its low candle-power. It is, however, still used as a firedamp detector, the height of the cap or halo of burning firedamp above the oil flame giving a rough indication of the percentage of firedamp in the air.

Electric lamps are now in general use for lighting purposes in mines. *See* Coal Mining.

Safety Valve. Contrivance fitted to vessels in which vapour or gas is generated or stored under pressure, to give relief if the pressure exceeds a pre-determined limit. Such a valve generally consists of a cone-seated or flat-seated valve held by a weight or spring. Weight-loaded valves are suitable only for stationary vessels where the axis of the valve is vertical and vibration non-existent or negligible. The weight-and-lever type (Fig. 1) has the advantage of requiring a smaller load than the dead-weight type (Fig. 2), but is more easily tampered with. For

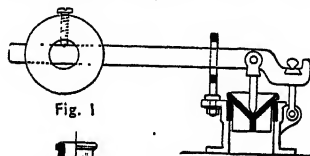


Fig. 1

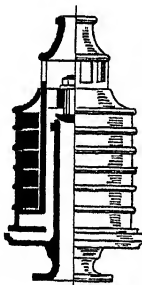


Fig. 2

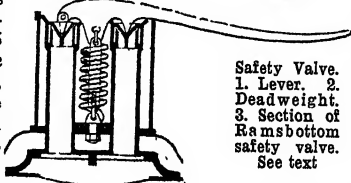


Fig. 3

Safety Valve.
1. Lever. 2.
Deadweight.
3. Section of
Ramsbottom
safety valve.
See text

locomotives and marine boilers the valve is restrained by an adjustable spring, acting directly or through a lever. The Ramsbottom type (Fig. 3) is frequently used for locomotive engines. A single spring serves for two valves, either of which can be relieved for testing purposes by raising or depressing a lever. This spring is in tension, but for marine and stationary boilers it is in compression. The load on the valve increases as the valve lifts, which means that the pressure will rise as the quantity of steam discharged increases. To obviate this the valve is provided with a flat seat or its equivalent, so that the area acted on is increased as soon as the valve lifts, giving rapid opening without appreciable increase of pressure. Safety valves should have sufficient area to ensure that excess vapour or gas can be discharged without appreciable increase of internal pressure. The wings of the valve, which act as guides, should have sufficient clearance, or the valve may stick. For maximum discharge, the valve is usually arranged to rise about one-fifth of its diameter.

Safflower, **SAFFRON THISTLE**, OR **BASTARD SAFFRON** (*Carthamus tinctorius*). Annual herb of the



Safflower. Flower heads and leaves

family Compositae. It is a native of Europe, Asia, and Africa. The leaves are oval with spiny teeth. The orange flowers are aggregated in terminal heads. They form a valuable dye stuff, yielding pink, rose, crimson, and scarlet, which is used chiefly for silks. It was known to the Egyptians, the flowers being found with their mummies. Mixed with talc and the whole finely ground, safflower becomes rouge.

Saffron (Arab. *za'faran*). Perennial herb (*Crocus sativus*) of the family Iridaceae. It is a native of Europe and Asia. The rootstock is a corm like that of the garden crocus, but larger. The grass-like narrow leaves are delicately fringed along the edges and keel; and the light purple flowers appear in autumn. Part of the female organs—the stigma and upper part of the style—are orange-coloured, and constitute the saffron of commerce, which has a strong aromatic odour and a bitter flavour, and is occasionally used in medicine and food, being especially common in Cornwall, where it is used for flavouring cake. It also yields an orange dye. As it requires some 750 fully developed stigmas to make 1 gramme of saffron, the substance has always been costly, and this has in the past often led to adulteration.

Saffron Walden. Mun. borough and market town of Essex, England. It is 44 m. N. by E. of London, with a rly. station. The chief building is the church of S. Mary the Virgin, a fine Perpendicular edifice. The town has a 16th century grammar school, a museum, and a hospital, while there are remains of a castle founded in Norman times. The chief occupation is horticulture. Earthworks and ditches show that

there was an early settlement here. The place was made a borough in 1514. Known at first as Walden, it derives its other name from the saffron crocus grown here until about 1750. Market days, Tues. and Sat. Pop. 7,000. See Audley End; Harvey, Gabriel.

Safi, **SAFFI**, OR **ASFI**. Port of French Morocco. It is on the W. coast, between Mazagan and Mogador, and exposed to the W. wind and difficult of access. Pop. est. 25,000.

Safid Rud. Name given to the lower part of the course of the Kizil Uzen, a river of N.W. Persia.

Safranines. Group of dye-stuffs prepared from coal-tar. The first safranin, known as aniline pink, was made by Perkin in 1863. The process now used commercially differs from Perkin's and consists in 'oxidising equimolecular proportions of paratolylene diamine, aniline, and ortho-toluidine.

Saga (Icel., from *segja*, to say). In Icelandic literature, a prose narrative. The term is applied to various classes of composition, biographical, historical, mythical, and romantic, but the typical saga is a prose epic, governed by fixed rules of style and structure. The oldest sagas, some of which were written before 1100, are biographies of leading men of the preceding age. Ari (1067–1148) was the first great saga writer, Snorri Sturlason (1179–1241), was a notable literary genius, and after Sturla Thorðsson (1215–84) the saga decayed.

The great sagas, many of which are anonymous, not only are admirably told heroic tales, but give a vivid picture of Icelandic society in the period of its greatest vigour. The finest is perhaps that of *Burnt Njal* (c. 1250). Others are the *Laxdolla* saga and those of *Egil*. Of sagas drawn from myths and legends the most famous is that of the *Volsungs*. Of historical

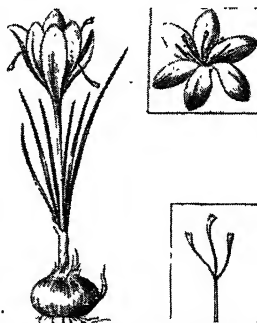
sagas those describing the Viking discoveries in America are among the most remarkable. In the 13th and 14th centuries Icelanders in Norway drew romantic sagas from the cycles of Alexander, Charlemagne, and Arthur. See *Iceland*; *Sturlason*, *Snorri*. Consult *The Saga Library*, W. Morris and E. Magnusson, 1891–1905.

In the 20th century the word saga acquired a new semi-colloquial use, being applied to long prose narratives, e.g. *Galsworthy's Forsyte Saga*.

Sagaing. Division, dist., and town of Burma. The div. comprises almost the whole of the valley of the Chindwin, with an extension S.E. towards Mandalay. The dist. which forms part of this extension has a relatively dense population. It is the driest dist. in Burma, having a rainfall of only 27 ins. Cereals and oilseeds are extensively cultivated. The town, which was the former capital, is a rly. junction on the right bank of the Irawadi opposite Ava. The rly. and road bridge, 5,894 ft. long, built 1934, was badly damaged in the Second Great War in the course of British operations for the recapture of Mandalay from the Japanese, Feb.–March, 1945. Division, area, 26,182 sq. m.; pop. 2,322,675. Dist., area, 1,825 sq. m.; pop. 387,270. Town, pop., 15,000.

Sagan. Town of Silesia. It stands on the Bober, 118 m. S.W. of Berlin, and is a rly. junction. The palace, built by Wallenstein, dates from 1630. There are R.C. churches dating from 1183 (rebuilt 1516) and from 1628. Industries, up to the time of the Second Great War, included textile, paper, and leather works. Sagan was known as a town from 1202, and from 1844 was a sovereign principality. After belonging to Saxony and to the Hapsburgs, it eventually came to Prussia. Here in 1759 the Russians defeated a Prussian army. It is in the part of Germany placed under Polish administration in 1945. Population (1935) 18,205.

Sagar. Island of W. Bengal, India, at the extreme W. of the Sunderbans, 99 m. S. of Calcutta in the Hooghly estuary where the Ganges is considered to reach the sea. In Jan. 50,000 Hindu pilgrims gather annually for the great bathing festival, lasting three days or more. Game is abundant, including tiger, deer, wild boar, and sea birds. In 1864 the island was struck by a cyclone which killed 4,000 out of the



Saffron. Corm, leaves, and flower. Inset, above, flower; below, pistil

5,600 inhabitants. On Middleton Point, in the S.W., is a 76-ft. lighthouse, the foundation of which was laid in 1808. The Hooghli is 15 m. wide at this point. Area, 225 sq. m.

Sage (Fr. *sage*, from Lat. *sapere*, to be wise). Name for a wise man. The term is applied to legendary heroes famous for their wisdom, and to persons whose wisdom gains for them the veneration of others. The Seven Sages of Greece, famous in medieval literature, were Thales, Solon, Periander, Cleobulus, Chilon, Bias, and Pittacus, each of whom was credited with a special maxim.

Sage (*Salvia officinalis*). Low shrub of the family Labiatae. A native of S. Europe, it is about a foot high, with a woolly stem and downy branches. The leaves are opposite, oblong, and wrinkled. The purple flowers are in whorls which form a spray. It has aromatic and bitter properties and is largely used in cooking.



Sage. Cutting of the aromatic herb

Sage may be grown in any dry, well-drained soil and a warm position. It is propagated from seeds or cuttings sown or planted in the spring. The branches should be cut, tied up in bunches, and hung, leaves downwards, in a well-ventilated shed or loft. When the leaves are quite dry they may be rolled between the palms of the hands, similarly to tobacco, and stored away in airtight covered bottles. See Pollen.

Sage, Russell (1816-1906). American capitalist. Born Aug. 4, 1816, he was brought up on a farm, and, after serving as errand-boy and assistant, became a retail grocer at Troy, N. Y., 1837. Entering the wholesale business two years later, he remained in Troy until 1863, when he moved to New York and went on the stock exchange, where he made a large fortune in rlys. He died July 22, 1906, leaving about £15,000,000 unconditionally to his widow, Mar-



Mrs. Russell Sage, American philanthropist

garet Olivia Slocum Sage (1828-1918). Her benefactions were correspondingly large, and included £2,000,000 to the Russell Sage foundation to improve the social and living conditions of the U.S.A., 1907; over £700,000 to educational purposes; and £60,000 for the Sage institute of pathology. She died Nov. 4, 1918, and by her will over £10,000,000 was distributed to charities, hospitals, and educational institutions.

Saginaw. Bay or arm of Lake Huron. It extends into the state of Michigan, U.S.A., for 60 m., and has a greatest breadth of 24 m. It receives the river Saginaw.

Saginaw. City of Michigan, U.S.A., the co. seat of Saginaw co. It stretches for 4 miles along the bank of the Saginaw river, 100 m. by rly. N.N.W. of Detroit, and is served by the Grand Trunk and other rlys. Timber mills have given way to coal depots and oil reservoirs. There are also food-processing plants. Settled in 1822, Saginaw became a city in 1857. Pop. 82,794.

Sagitta (Lat., arrow). Small constellation N. of Aquila. It is one of the most ancient of the constellations. None of its stars is above the fourth magnitude, though several are variable stars. See Constellation.

Sagittaria. Genus of about 12 species of perennial marsh and aquatic herbs. One of them, the arrowhead, is native to Great Britain, Europe, and Asia; the others are all American. The leaves, which are floating or erect, spring from a short, thick root-stock, and in about half the species are arrow-shaped; in others lance-shaped or oval. The white flowers are produced in three to five whorls, the upper ones males, the lower females. See Arrowhead.

Sagittarius (Lat., archer). Ancient constellation and ninth sign of the Zodiac. It follows the Scorpion on the line of the ecliptic, and lies very near the S. horizon of British skies. The constellation contains many famous star clusters and nebulae. Though it has no stars brighter than the third magnitude, it is crossed by the brightest part of the Milky Way.

Sago (*Metroxylon laeve* and *M. rumphii*). Trees of the family Palmae. They are natives of New Guinea and Malaya. Stout trunks terminate in a crown of long, feather-shaped leaves. The smooth sago-palm (*M. laeve*) is the larger species, and distinguished from the prickly sago-palm (*M. rumphii*) by the leaf-stalks of the latter being armed with long, sharp spines. The sago of commerce is prepared from the soft inner portion of the trunks by washing and pounding, by which process the starchy matter is separated. The name sago-palm is also applied to the fern palms (*Cycas*) from whose seeds a kind of sago is prepared. See Fern Palm.

Saguenay. River of Quebec, Canada, a tributary of the St. Lawrence. It issues from Lake St. John by two rapids, and during the earlier part of its course is unnavigable. From Chicoutimi, however, it can be used by small vessels, and from Ha Ha Bay, a pleasure resort on the river, by the largest ones. The lower course is in a fjord valley flanked by rock walls rising from 1,000 to 1,800 ft., with a depth in mid-channel of 800 ft. The length of the river is 120 m., and Tadoussac stands at its mouth. The Ashwappmuchuan, which flows into Lake St. John, is sometimes called the Upper Saguenay. With its headstream, the Peribonka, it is 405 m. long.



Sagunto, Spain. Ruins of the Roman theatre

Sagunto. City of Spain, in the prov. of Valencia. The ancient Saguntum, it stands near the mouth of the R. Palancia, 18 m. by rly. N.N.E. of Valencia. Perhaps founded by a Greek colony from Zacynthus, it became a useful commercial port, but now lies inland, the sea having receded about 3 m. Sagunto is famous for its heroic resistance in 219 B.C. to Hannibal, to whom it fell, through starvation, after a siege of eight months,

its fall being the prelude to the second Punic War. Afterwards Saguntum became a Roman municipality, and traces of its prosperity are seen in the theatre, one of the best preserved of Roman monuments, in remains of walls, temples, pillars, the foundations of the citadel, inscriptions, etc. Called by the Romans Murviter, it became Murviedro after its deliverance from the Moors in the 12th century. The name Sagunto was restored in 1868. Old Sagunto is on the N. slope of a hill crowned with a castle. Although regarded as an almost impregnable fortress, it surrendered to the French in 1811. Pop. 11,400.

Sahara. Desert of N. Africa. It stretches from the Atlantic to the borders of the Nile, and includes the S. portion of Morocco, Algeria, Tunisia, and Libya, with portions of Egypt. In the N.E. is the Libyan desert (*q.v.*), and in the S. the Sahara extends to the neighbourhood of the river Niger and Lake Chad. The surface is not uniform, nor is the whole region sterile country. It is broken by a succession of dunes, and in some places is depressed below the level of the sea, whilst in others it attains a high alt. and is marked by lofty plateaux crowned by isolated mountain ranges, *e.g.* Ahaggar, whose peaks exceed 8,000 ft. These ranges are cut by deep valleys.

Portions of the desert are dotted with fertile oases which mark the great caravan routes from the Mediterranean to the W. Sudan, from Tripoli, Benghazi, and other ports through Fezzan; and much of the country, hitherto regarded as useless, especially in the regions N. of the river Niger, is capable of sustaining herds of cattle. The deep valleys which cross the desert frequently mark the courses of dried-up rivers, and water may probably be reached in many places by boring. The surface is not entirely covered with sand, but huge tracts are strewn with blocks of granite and other rocks, or covered with stones. These tracts are frequently varied by the remains of what were once broad marshes, where the water has evaporated and left great deposits of salt. There is no doubt that within historical times large portions of the Sahara have been much more fertile than they are at present, and even as late as the time of the Romans there were military posts far to the south.

The climate of the Sahara is excessively hot and unbearable for

Europeans; but a few indigenous nomad tribes subsist in the oases or the deep valleys. At Insalah, Algeria, the monthly mean temp. reaches 98° F. in July; at Azizia, Libya, 137° F. has been attained. The difference between day and night is striking, so quickly is heat lost by radiation to the clear skies; summer nights may be chilly, and frosts occur in winter. What little rain there is falls chiefly in isolated storms. Hot surface winds, often sand-laden, blow from the desert to neighbouring areas, where they are distinguished by such names as Leste, Leveche, Sirocco (*qq.v.*).

The greater part of the Sahara is under the control of France and forms part of French West Africa. The French have also gradually extended their occupation S. from Algeria and Tunisia, and many districts formerly regarded as sterile are now being cultivated. Many plans have been proposed for railways across the desert and extensive surveys undertaken under government auspices. There are air routes across the desert, where emergency landing grounds have been laid out.

Chief travellers in the Sahara during the 19th century were Laing, Richardson, Barth, Rohlf, and Nachtigal. In 1920–21 Rosita Forbes journeyed through the Libyan desert to Kufra, the sacred city of the Senussi (*q.v.*). During the Second Great War, Gen. Leclerc, the Free French commander, led a mixed French and native force across 1,500 m. of the Sahara from Fort Lamy (Chad Territory) to conquer the Saharan prov. of Fezzan between Jan. 4 and 29, 1943, and assist the British 8th army in completing the clearance of the Germans from Tripolitania and Tunisia. *See* Africa.

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Saharanpur. Dist. and town division, Uttar

union, India. The district lies between the Jumna and Ganges in the N. of the division. Annual rainfall is 38 ins. Wheat and barley are the chief crops. Area, 2,134 sq. m. Pop. 1,179,643.

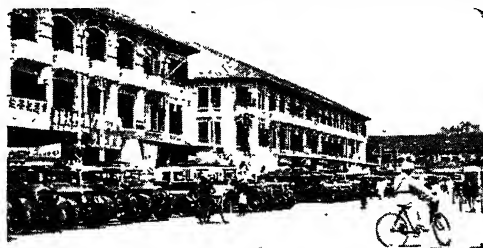
Saharanpur town is the headquarters of the Jumna canal administration and a rly. junction 60 m. N. of Meerut. Founded in the 14th century, it possesses the shrine of Shah Haran Chisti, and was a summer resort of the Moguls. Botanical gardens started in 1817 by the E. India Co. are famous. The trigonometrical survey of the Himalayas was opened in 1835 at Nojli close by. Pop. 108,263.

Sahet Mahet, or **SRAVASTI**. Ruins of Jain temples in the United Provinces, India. They are situated in Godna dist. in Oudh, 80 m. E.N.E. of Lucknow. The ruined city of Sravasti was in ancient days one of the principal seats of Buddhist learning. *See* India; Jain.

Sahib (Arab., friend). Title of respect in India. It is used by natives in addressing and speaking of Europeans, and is added to native names and to titles and offices, *e.g.* Tippoo Sahib, Khan Sahib, Collector Sahib. European ladies in India are called by courtesy mem-sahib.

Saiga (*Saiga tatarica*). Species of antelope. It is distinguished by the extraordinary shape of the head. The nose is convex and inflated, giving a bulbous appearance to the face, the ears are small, and the horns are short, widely placed, and lyrate. It now occurs only in S. Russia and S.W. Siberia; but its remains are found in Great Britain. Its pelt is tawny yellow to grey on the upper parts and white beneath.

Saigon. Seat of govt. of Vietnam since 1949. Situated in S. Vietnam (Cochin China, of which it was formerly the capital), it is on the Saigon river, 40 m. from the S. China Sea. It is a great commercial



Saigon, Vietnam. A typical street scene

centre of the country, and was long the principal French military and naval base in the Far East

Buildings include government offices, town hall, cathedral and theatre. In the botanical gardens wild beasts live in natural surroundings. A commodious harbour is accessible to the largest steamers, and is equipped with shipbuilding yards and repair shops. Adjoining Saigon to the south-west is the large commercial city of Cholon.

Saigon, an administrative capital in the Annamese empire, was captured by the French in 1859 and ceded to them in 1862. On July 28, 1940, the Vichy French govt. was compelled to permit Japanese occupation of airfields and naval installations at Saigon. The Japanese developed the port into a base for operations against Singapore and the East Indies. F.-M. Count Terauchi, commander of Japanese forces in the southern regions, surrendered here in person to Admiral Mountbatten, Nov. 30, 1945. Pop. 217,518.

Sailcloth. Fabric used for the sails of ships and windmills. Ships' sails are mostly made of stout canvas. The sails of windmills were formerly canvas, but are now usually boarded. Originally sailcloth was made only of hemp or flax, but now cotton, ramie, and mixtures of flax and cotton are also used. See Ship.

Sailing. Navigation of wind-driven boats. Up to the beginning of the 18th century the sailing of yachts was almost exclusively confined to royalty and the wealthy classes, but the building of small craft and the formation of yacht clubs has enabled many to enjoy the pastime. The Norfolk Broads are favourite resorts for sailing small craft. Larger boats use the Solent. See Ship; Shipbuilding; Yachting.

Sailors' Society, BRITISH. Organization founded in 1818. It provides residential clubs and canteens in ports all over the world; port chaplains and missionaries; a world-wide welfare service with resources to meet every need of seamen and their dependents; library service for ships and lighthouses; and a school at which sons of deceased or disabled seamen are trained and maintained free; it is the oldest and largest seamen's society. The headquarters of the society are at 680, Commercial Road, London, E.14.

Sainfoin (*Onobrychis sativa*). Deep-rooted leguminous plant, particularly suitable for haying or grazing purposes in calcareous soils in the warmer parts of Great Britain. Its long leaves have six to

ten pairs of leaflets, with one at the end, and the pink flowers are arranged in conspicuous racemes. The pod is wrinkled and contains one brown seed. Common or English sainfoin is perennial, and is left down for three to seven years,



Sainfoin. Leaves and flowers of the field herb

yielding one cut of hay in the year. Giant or French sainfoin is a rapidly growing plant, giving two cuts of hay per annum, but does not last more than two years. Sainfoin is usually drilled from April to the end of May. When unmilled, i.e. with the husk on, about 4 bushels per acre are necessary, but 56 lb. is the average amount for milled or shelled seeds. *Pron.* Sanfoyn.

Saint (Lat. *sanctus*, holy). One whose life has been consecrated to the service of God. The phrase "called to be saints," in Rom. 1, v. 7, implies that all Christians are saints; and to the description of Our Lord as King of Saints, Rev. 15, v. 3, A.V., has the marginal note "or nations or ages," the R.V. reading being "King of the ages," with the note "many ancient authorities read nations."

The prefix Saint (St. or S.) to the names of the Apostles and Evangelists in the N.T. dates from the end of the 3rd or the beginning of the 4th century, when the word was applied especially to martyrs, the manner of whose death was regarded as winning immediate admission to Heaven. Thousands of saints are commemorated in the *Acta Sanctorum* (q.v.) of the Bollandists; those having days

allotted to them in the English Prayer Book number 73. In the R.C. Church the worship accorded to saints is called *douleia*; the worship of the Virgin Mary, *hyperdouleia*; and the adoration paid to God alone, *latreia*. In accordance with ancient custom, churches, abbeys, monasteries, convents, hospitals, colleges, and many school churches are dedicated to or named after saints. The word enters largely into topography, and many countries have their patron saints, as England has S. George; France, S. Denis. See entries under the names of the principal saints; Beatification; Canonisation; Hagiology.

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St. Abb's Head. Rocky promontory of Berwickshire, on the coast of Scotland, 4 m. N.W. of Eyemouth. S. Ebba, after whom it is named, founded a monastery here in the 7th century. The promontory is 310 ft. high, and surmounted by a lighthouse visible for 21 m. St. Abb's, formerly

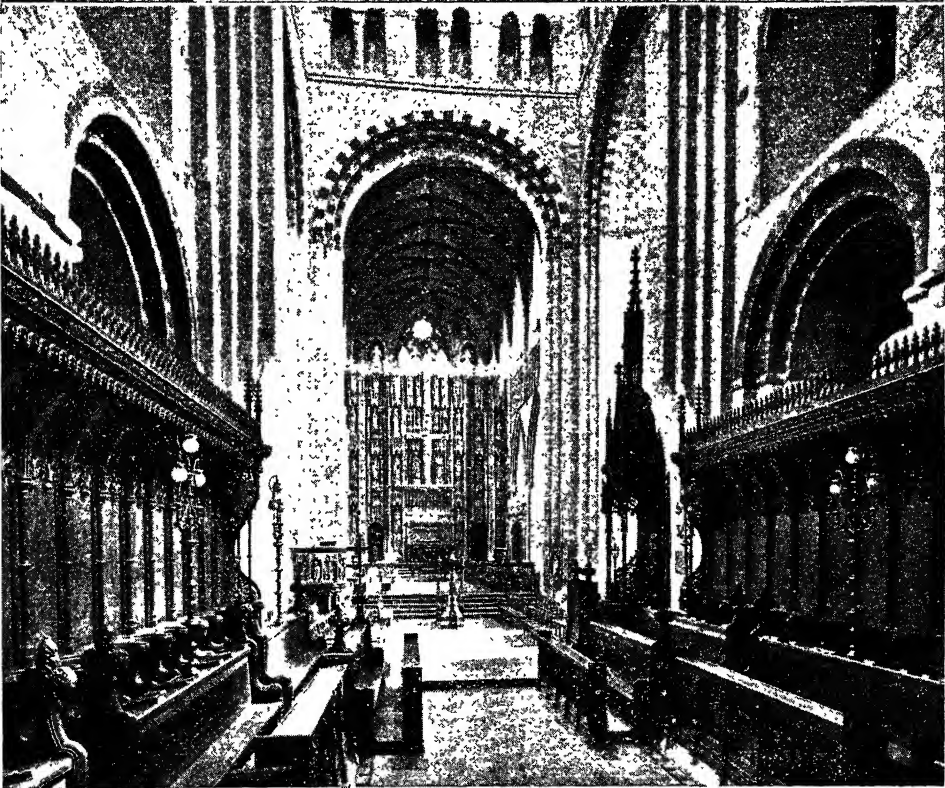


St. Abb's Head, Berwickshire. The cape and lighthouse from Kirk Hill
Valentine

Coldinghamshire, a seaside resort and fishing village, lies 2½ m. S.E.

St. Agnes. Seaside resort of Cornwall, England. It is 8 m. by rly. N.W. of Truro. John Opie, the painter, was a native. Near the town is St. Agnes beacon, 597 ft. high, and St. Agnes Head is about a mile away. Pop. 4,000.

St. Agnes. One of the inhabited Scilly Islands. It lies about 2 m. S.W. of St. Mary's. Objects of interest include a holy well, a disused lighthouse dating from 1680, and rock formations. Pop. 59.



Top, the West Front, restored in 1894, showing the Norman tower, faced with Roman tiles, and the Gothic nave, the longest in existence (292 ft.). Below, the choir, looking towards the Wallingford screen and the High Altar, showing the Norman arches of the church built by Paul de Caen

ST. ALBANS CATHEDRAL: ONE OF THE EARLIEST NORMAN CHURCHES IN ENGLAND

St. Albans. Mun. bor., city, and market town of Herts, England. It stands above the river Ver, 21 m. N.W. of London, with which it is connected by rly. and Green Line. To the W., in Prae Wood, and in Gorhambury and Verulamium, are remnants of the British-Roman city of Verulamium, destroyed by Boadicea in A.D. 61 and by the Saxons in the 5th century. Here was the only Roman theatre yet uncovered in England. The city, built by the Saxons on the summit of Holywell Hill, and called Watlingceastre, became known as St. Albans after the foundation by Offa II, in 793, of a Benedictine abbey in memory of England's protomartyr Alban (q.v.). The abbey was rebuilt by Paul de Caen (1077-97) and his successors on a magnificent scale. Suppressed in 1539, its church was sold to the city for a parish church and grammar school in 1553.



St. Albans arms

The cruciform church, partly renovated by Sir Gilbert Scott in 1856, and thoroughly restored, amidst a storm of criticism, by Baron Grimthorpe, was constituted in 1875 the cathedral of a new diocese which took in the county of Herts. Standing 320 ft. above sea level, 550 ft. in length, and 175 ft. in breadth across the transepts, it has a central Norman tower faced with Roman tiles, 145 ft. high, and exemplifies all styles of architecture. It is notable also for its high altar screen, rood screen, choir ceiling, Saxon baluster columns and frescoes, and its monuments. The brasses include one to Robert Fayrfax (d. 1529), a notable organist of the abbey. Excavations in the deanery garden in 1920 disclosed the floor of the chapter-house.

England's third printing press was set up here by Abbot Wallingford in 1480. The 14th century abbey gatehouse, long the home of St. Albans grammar school, was for some time used as a gaol. The school records go back to the 11th century. Three churches, S. Peter's, S. Stephen's, and S. Michael's, all restored, were founded in Saxon times by Abbot Ulsinus, or Ulsig, who also started the market. S. Michael's contains a beautiful 17th century carved pulpit and a monument to Francis Bacon. Near by were excavated, in 1847 and 1934, remains of the Roman theatre, and, in 1898-1908, part of a town hall and forum. On the restored Clock

Tower, 1403-12, near the market place, a plaque records the neighbouring site of an Eleanor cross. The town hall dates from 1826. The Fighting Cocks inn is a 16th century octagonal building.

Printing, light engineering, orchid culture, and clothing and hosiery manufacture are carried on. Incorporated in 1554, St. Albans was a parl. bor. until 1852, and now gives its name to a county constituency. Millenary celebrations were held in 1948. Market days, Wed. and Sat. Pop. 42,000. *See* Bacon, Francis; Gorhambury; Inn illus.; Pulpit illus.; Roman Remains; Verulamium. *Consult* Historical Records of St. Albans, Gibbs, 1888; History of the Abbey of St. Albans, L. F. Rushbrook-Williams, 1917.

St. Albans, BATTLES OF. Fought between Yorkists and Lancastrians, May 22, 1455, and Feb. 17, 1461. When in 1455 Richard of York took up arms, Edmund Beaufort, duke of Somerset, the chief adviser of Henry VI, at once collected an army about 3,000 strong and left London for the north. Reaching St. Albans, they heard that the Yorkists were at hand and so prepared to fight in the town. The royal standard was pitched in the main street, and the ways into the city were barricaded. After a short but stubborn fight Somerset was killed, his followers put to flight, and the king was made prisoner by the Yorkists.

After their victory at Wakefield, Dec. 30, 1460, the Lancastrian queen and her followers marched towards London. Warwick, to oppose them, collected the remaining Yorkists and had a strong force, drawn mainly from the home counties, when he arranged his men in order of battle just outside St. Albans. For the first time in English military history he had cannon with him and also other firearms. But in spite of his preparations, the Yorkists were surprised, and the first fighting took place in the town itself, their left flank there being unexpectedly assailed. The archers beat back this attempt, but a second broke the Yorkists, who were routed. *See* Roses, Wars of the.

St. Albans, DUKE OF. British title borne by the family of Beaulieu since 1684. In 1628 Richard Bourke, earl of Clanricarde, was made earl of St. Albans, but the title died out with his son in 1657. From 1660 to 1684 Henry Jermyn, the favourite of Henrietta Maria, was earl of St. Albans. He was with the exiled royal family during

the Commonwealth, and was said to have been secretly married to the queen. In 1685, the year of Jermyn's death, Charles II made his son, Charles Beaulieu (1670-1726), duke of St. Albans, Nell Gwynn being the boy's mother. Charles was made hereditary falconer, a post held by his successors, though the emoluments were commuted by the state in the time of the 10th duke. Charles's descendants followed in the title, the 9th duke marrying the actress Harriet Mellon, widow of the banker Thomas Coutts. Osborne (b. Oct. 16, 1874) became 12th duke in 1934 in succession to a brother.

St. Aldegonde, PHILIP VAN MARNIX, LORD OF (1536-98). Ne herlands statesman. Born in Brussels, of noble family, he passed some of his early life in Geneva, where he was under Calvin's influence. In the Netherlands he became a leading spirit among the reformers, and was prominent in the rising against Spain, chiefly as a diplomatist. In 1583 he was made burgomaster of Antwerp, a post he held through the siege of that city by the Spaniards in 1584-85. He died at Leyden, Dec. 15, 1598. As a writer, St. Aldegonde is known by his metrical translation of the Psalms.

St. Aldhelm's Head. Promontory on the English Channel, 5 m. S.W. of Swanage, Dorset, and the S. extremity of the Isle of Purbeck. A common corruption of the name is St. Alban's Head. Here is a Norman chapel dedicated to S. Aldhelm (c. 640-709), bishop of Sherborne in 705. The cliffs attain 350 ft., and there are many fine walks hereabouts.

St. Aldwyn, MICHAEL EDWARD HICKS-BEACH, EARL (1837-1916). British statesman. Born Oct. 23, 1837, he belonged to a Gloucestershire family, and in 1854 succeeded his father as 9th baronet. He was educated at Eton and Christ Church, Oxford, and in 1864 entered the house of commons as M.P. for E. Gloucestershire, retaining that seat until 1885, after which he represented W. Bristol till 1906. Sir Michael joined the Conservative ministry as chief secretary for Ireland, 1874-78, and secretary for the colonies, 1878-80. He left office then, to return in 1885 as



Earl St. Aldwyn,
British statesman
Russell

chancellor of the exchequer and leader of the house. A short Liberal ministry followed. In 1886-87 he was again Irish secretary but not leader of the house. After a year's rest on account of his health, he was president of the board of trade, 1888-92. As chancellor of the exchequer 1895-1902, he disliked Chamberlain's plan of tariff reform. In 1906 he was made a viscount, and in 1915 an earl. He died April 30, 1916, being succeeded by his grandson Michael John (b. Oct. 9, 1912). *Consult* Life, V. Hicks-Beach, 1932.

St. Amand les Eaux. Town of France. In the dept. of Nord, it stands at the confluence of the Scarpe and the Elnon, 6 m. N.W. of Valenciennes. Pop. 14,218.

St. Andrews. City, burgh, and seaport of Fife, Scotland. Standing on cliffs rising above the sea, it is situated on St. Andrews Bay, an opening of the North Sea, 12 m. S.E. of Dundee. Here the Eden falls into the sea.



St. Andrews arms

Attractions in a city of remarkable beauty include the ruins of the castle and the cathedral. The former, at first the residence of the bishops, was the scene of many interesting episodes. Of great strength, it was nevertheless captured more than once, and its dungeons housed prisoners of eminence. The cathedral was a noble building of the 12th and 13th centuries; it originated in a priory which long flourished here. After the Reformation it decayed, and some walls and towers alone remain. The university has mainly modern buildings. There are also a parish church, town hall, public halls, and hospital. The Martyrs' Memorial is noteworthy. Madras College is a celebrated school, and another is the girls' school that occupies the buildings of S. Leonard's College. Of the city gates only the West Port remains. St. Andrews is the headquarters of golf, and providing for players and visitors is its main industry. The Royal and Ancient Club, founded in 1754, has its fine links here. The city is served by branch rly. from Leuchars and has a small harbour.

St. Andrews is said to owe its name and origin to the fact that S. Regulus, bearing the bones of the apostle, settled here in the 7th century. In the 9th century it was made a bishopric. Later its bishop became primate of Scotland and



St. Andrews, Scotland. Ruins of the cathedral, built in the 12th and 13th cents.

was an archbishop until 1688. There is still a R.C. archbishop of St. Andrews and Edinburgh. It was made a royal burgh in 1124. Pop. est. 8,750. *Consult* St. Andrews, A. Lang, 1893; Handbook to the City and University, J. M. Anderson, 1911.

St. Andrews, UNIVERSITY OF. Scottish university. It was founded in 1411 by Henry Wardlaw, bishop of St. Andrews, and was made a university by papal bull in 1413. In 1450, Bishop Kennedy founded the college of S. Salvador, and in 1512 that of S. Leonard was founded. The original university was made into the college of S. Mary in 1537, and is now confined to students of theology. In 1747, S. Salvador's and S. Leonard's were formed into the United College. The college buildings include S. Mary's College, which has part of the original edifice, the United College, a modern building occupying the site of S. Salvador, the university chapel, the library and medical buildings erected at the expense of the 3rd marquess of Bute. There are also lecture rooms, museums, and laboratories.

The university is managed by a chancellor and rector, the latter being president of the university court. Its acting head is the principal, and it unites with the

other Scottish universities to send three members to parliament.

University College, Dundee, dating from 1880, is part of the university. *See* Gowns colour plate.

St. Anne's-on-Sea. Watering-place of Lancashire, England, now joined with Lytham to form Lytham St. Annes (*q.v.*).

St. Anthony's College. College of Oxford university. Inaugurated in 1950 in Halifax House, Woodstock Rd., with accommodation for 20 students, it owed its foundation to Antonin Besse, a French shipowner who in 1948 put up £1,500,000 anonymously for the creation of a new college for post-graduate work in international and economic affairs; the only condition was that a proportion of the students should be French. The first warden, F. W. D. Deakin, historian and linguist, was in 1943 dropped into Yugoslavia where he earned the D.S.O. serving with Marshal Tito.

St. Anthony's Pigs. In medieval times friars of S. Anthony (1195-1231), members of the Franciscan order, enjoyed the right of allowing their swine to roam at liberty in search of food. Remedy for damage caused by these animals, which were distinguished by a T cross, had to be sought in the court of the ecclesias-



St. Andrews University. Buildings of the United College of S. Salvador and S. Leonard. *See* also frontispiece to this vol.

tical ordinary, and the custom became such a nuisance that many towns compounded for its extinction. Thus for several centuries Bruges paid an annual £2 sterling to the monastery of S. Anthony at Bailleur on condition that no T Anthony pig should be allowed to roam within the town.

St. Arnaud. Township of Victoria, Australia. It is 158 m. N.W. of Melbourne by rly. Gold mining and agriculture are its chief industries.

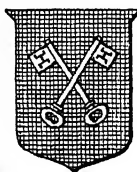
St. Arnaud, JACQUES LEROY DE (1796-1854). French soldier. Born in Paris, Aug. 10, 1796, he entered the army in 1817 and had an adventurous and chequered career before making his reputation as an officer in the foreign legion in Algeria. He defeated the Kabyles in 1851, and in the same year, being then



J. L. de St. Arnaud,
French soldier

minister for war, assisted Louis Napoleon in his *coup d'état*. On the outbreak of the Crimean War, being then a marshal, he was appointed to the command of the French forces, but he died a few days after the battle of the Alma, Sept. 29, 1854.

St. Asaph. City and market town of Flintshire, Wales. It is 5 m. N. of Denbigh, with a rly. station, and stands on elevated ground near the junction of the rivers Clwyd and Elwy. The chief building is the cathedral, a plain cruciform edifice dating mainly from the



St. Asaph arms

14th century, although the choir was restored in the 15th. Sir Gilbert Scott restored the cathedral in the 19th century. The library is small but valuable. St. Asaph has a parish church, a grammar school, and an old bridge across the Elwy. It is the centre of an agricultural district. The city, called in Welsh Llanelwy, grew up around a monastery founded about 560. The church became the cathedral and took the name of Asaph, the successor of Kentigern. Market day, Thurs. Pop. est. 2,000. See Edwards, A. G.

St. Augustine. City of Florida, U.S.A., said to be the oldest permanent European settlement in the country. It stands on a peninsula, fronting the Atlantic Ocean,

36 m. from Jacksonville. Its appearance is picturesque, with old streets and houses and many reminders of its Spanish past. It has a Spanish fort of the 17th century where, during the revolution, three prominent signees of the declaration of independence, who had been captured by the British in S. Carolina, were imprisoned. Notable are the R.C. cathedral, Trinity Church, and the post office, once the headquarters of the Spanish rule. The industries include the manufacture of rly. stock and cigars, also fishing. St. Augustine is a pleasure and health resort. The city was founded by the Spaniards on S. Augustine's Day, 1565. It was fortified, and was attacked and occasionally plundered by the English. Having been British from 1763-83, it was ceded by Spain to the U.S.A. in 1821. Pop. 12,090. Consult Old St. Augustine, C. B. Reynolds, 1835.

St. Austell. Market town and urban dist. of Cornwall, England. It stands above St. Austell Bay, on

the S. coast of the county, 14 m. N.E. of Truro, with a rly. station. The church of Holy Trinity, dating partly from the 13th century, has a splendid Perpendicular tower; it was restored in the 19th century. Other buildings include the town hall and market house. St. Austell was the centre of a tin and copper mining district, but the metal industry has since the 1920s been largely superseded by the production of china clay, used in the making of fine chinaware. Of this clay the St. Austell district is now the greatest producer in the world. A. L. Rowse (g.v.) was a native of St. Austell. Market day, Fri. Pop. (town) 10,000; (district) 23,000.



St. Asaph, Flintshire. Cathedral from the south-west

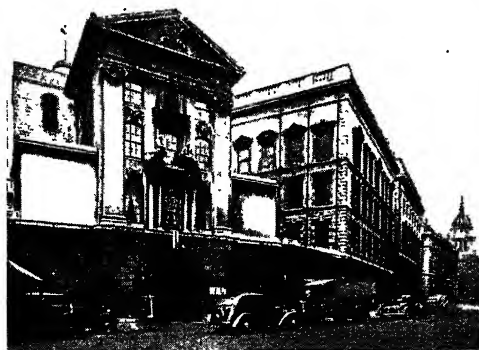
St. Bartholomew, MASSACRE OF. Name given to the murder of the Huguenots in France which began on St. Bartholomew's Day (Aug. 24), 1572. Its authorship is usually attributed to the king's mother, Catherine de' Medici, but its causes were probably more complex. It began with a plot to murder Coligny, whose influence with the king was dreaded by the queen-mother and others. This failed, but it aroused a good deal of suspicion, and both sides prepared for bloodshed. Taking advantage of the presence in Paris of many Huguenots who had come to attend the marriage of the king's sister Marguerite and Henry of Navarre, Catherine, backed by the Guises and others, persuaded Charles IX to strike at their foes. He consented, and the massacre began in Paris, spreading to the provinces, and lasting until Oct. 3. One authority states that 50,000 were killed, but 25,000 is probably nearer the mark. Gregory XIII issued a medal in commemoration.



St. Austell, Cornwall. Fore Street, showing the tower of the parish church of Holy Trinity

St. Bartholomew's Hospital. Hospital and medical school at Smithfield, London. The hospital and priory of St. Bartholomew were founded by Rahere in 1123, but a century later the hospital was a separate community.

A bequest of Whittington in 1423 was used for repairs to the hospital. Its constitution was remodelled in 1544, and in 1547 the king gave it to the City of London. New endowments were found by the city, and the government of the foundation was entrusted to twelve governors, of whom four were aldermen appointed by the lord mayor. The hospital was rebuilt by James Gibbs in 1760, and this building was added to in 1793. Part of



St. Bartholomew's Hospital, London. The main entrance to the building in Smithfield

the adjoining site of Christ's Hospital (*q.v.*) having been acquired, new blocks, containing 10 medical and 10 surgical wards, were erected on the S. side of the quadrangle, being completed in 1937.

The oldest part of the structure is the entrance gateway from Smithfield, 1702, which is scheduled as an ancient monument. The paintings on the main staircase are the work and gift of Hogarth, and by Reynolds, Lawrence, Kneller, Millais, and Luke Fildes in the Great Hall.

Within the original hospital there were three chapels, of which one only, that of the Holy Cross, survives under the name of S. Bartholomew-the-Less, rebuilt in wood by George Dance, in 1789, in stone by Thomas Hardwicke in 1823, and restored since.

The medical school of the hospital dates from 1662. "Barts" has 689 beds, 350 for surgical cases, and treats 8,000-9,000 in-patients and 270,000 out-patients annually. During the Second Great War part of the hospital was moved to buildings near St. Albans, and it was later planned to keep some of its activities in Herts, a site near Watford being selected for this purpose. *Consult* History of S. Bartholomew's Hospital, 2 vols., N. Moore, 1919.

St. Bartholomew the Great. Old London church. In W. Smithfield, E.C., and remarkable for its magnificent Norman pillars and arched recesses, it now consists of very little more than the choir and transepts of the church of the Augustinian priory

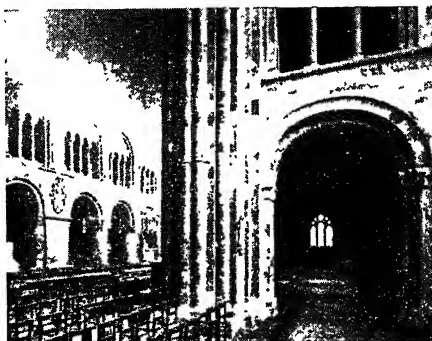
founded by Rahere (*q.v.*), 1123. Of the W. façade all that remains is a 13th century gateway. Restoration was carried out from 1864 to 1906, mainly under Sir Aston Webb. The lady chapel, restored in 1897, served at one time as a printing office, in which Benjamin Franklin worked, and as a fringe factory; while the N. transept, reopened in 1893, accommodated a blacksmith's forge. The 12th century Norman tower was replaced in 1628 by the existing brick struc-



St. Bees, Cumberland. View of the shore and the town, from St. Bees Head

ture, which contains five 16th century bells. Hogarth was baptized at the existing font. The tombs of Rahere and Sir Walter Mildmay, founder of Emmanuel College, Cambridge, are among the features of the interior of the church.

Milton, Benjamin Franklin, Hogarth, Dr. Caius, and Washington Irving are among those who have lived in Bartholomew Close. *See* Bartholomew Fair; London; Smithfield.



St. Bartholomew the Great, London. Interior of the Norman church, looking east

St. Bees OR ST. BEGHA. Town of Cumberland, England, 4 m. by rly. S. of Whitehaven. It derived its name from St. Begha, an Irish princess, who is said to have established a nunnery here about 650. Destroyed by the Danes, this was succeeded by a Benedictine priory, founded during the reign of Henry I, to which the present church belonged. A theological college, established by Bishop Law in 1816, was closed in 1896; the grammar school, founded in 1587, was enlarged in 1881. On St. Bees Head, 335 ft., is a lighthouse. Pop. 1,208.

St. Benoit. Town of Réunion, a French island in the Indian Ocean. It is on the N.E. of the island, 23 m. S.E. of St. Denis, and is connected by rly. with Pointe-des-Galets and St. Pierre. Pop. est. 13,000.

St. Bernard Dog. Large dog of the mastiff group. It derives its name from the hospice on the Great St. Bernard Pass, where



St. Bernard Dog. Champion specimen of the breed

these dogs were used for finding travellers lost in the snow. It is the largest of all the domesticated dogs known in Great Britain.

The original breed at the Great St. Bernard is of unknown descent, and was almost destroyed by the severe winter of 1812, or by an epidemic. The present breed has descended from the famous show dog, Barry, but is said to depart considerably from the old type. The St. Bernard has a high head, with deep-set eyes, pendulous lips,

and moderate-sized pendent ears. Its feet are very large. The dog has remarkable intelligence. See Dog colour plate.

St. Bernard Pass, GREAT. Mt. pass of the Pennine Alps, between Valais in Switzerland and Piedmont in Italy. It is on the road from Aosta to Martigny (50 m.), reaches an alt. of 8,110 ft., and was known to the Romans as Mons Poeninus. A pack-horse road existed by A.D. 69. By this pass Napoleon led his army into Italy in 1800. On the summit are a monastery and an inn. The hospice founded about 962 by S. Bernard de Menthon, has a church dating from 1680. There are bed-



St. Brelade, Jersey. The 12th century parish church

St. Boniface. City of Manitoba, Canada. It stands on the E. side of the Red river, just opposite Winnipeg, of which it is virtually a suburb, and is served by the

side of St. Brelade's Bay, and has a fine sandy beach. The parish includes the village and also St. Aubin town; its pop. is about 2,000.

St. Briac. Holiday resort and fishing village of N. France. In the dept. of Ille-

et-Vilaine, it is about 4 m. from St. Lunaire, at the mouth of the Frémur, and overlooking a picturesque bay. The modern church has a 16th century tower. The Sailors' Cross is a well-known landmark. There are excellent golf links. The place takes its name from an Irish saint, who died at Bourgbriac, Côtes-du-Nord, c. 570.

St. Briavels. Parish in Glos, England. Overlooking the Wye, 7 m. by rly. N.E. of Chepstow, it is noted for its church and the remains of its castle, and gives its name to the hundred in which the Forest of Dean is situated. Certain forest privileges still attach to those born in the hundred of St. Briavels. The castle was built in the 11th century as a defence against the Welsh. A ruined keep remains; other parts, having been restored, are now a private residence. St. Briavel's long had a custom of charging twopence each to the parishioners in order to buy bread and cheese for all paupers who attended church on Whit Sunday. Pop. 1,100.

St. Bride's or **S. BRIDGET'S.** Church off the S. side of Fleet Street (q.v.), London, E.C. Its



Great St. Bernard, Switzerland. The hospice, founded by S. Bernard for travellers crossing the Alps; in the background, Mt. Velan

rooms for 175 travellers; the oldest part dates from the 15th century. In a museum are kept relics of Roman times.

St. Bernard Pass, LITTLE. Mountain route over the Graian Alps between Italy and Savoy. It is on the road between Courmayeur and Bourg St. Maurice, and attains an alt. of 7,176 ft. It had a hospice with observatory. Hannibal is reputed to have crossed the Alps by this pass, which certainly was used by the Romans about 100 B.C., or perhaps a little earlier. After the Second Great War the whole pass became French territory, and in 1947 the monks left.

St. Blazey. Market town and parish of Cornwall, England, 4 m. by rly. E.N.E. of St. Austell. It takes part in the china clay industry of the neighbourhood. Market day, Sat. Pop. 3,100.

C.P.R., C.N.R., and elec. rly. to Winnipeg. The industries include the making of bricks, flour, and agricultural implements, and there are lumber yards, breweries, abattoirs, and sheet metal works. It is the seat of a R.C. archbishop. Its original name was La Fourche, referring to the fork here formed by the Red and Assiniboine rivers. St. Boniface suffered in the Red river floods of 1950. Pop. 18,157.

St. Brelade. Parish and village on the S.W. coast of Jersey. It is picturesquely situated on the W.



St. Bride's, London. The interior of the church after the German fire raid of Dec. 29, 1940. Right, the steeple



records go back to the 13th century. Burnt in 1666, it was rebuilt in 1680 by Wren, who, in 1701, added to it his tallest steeple, lowered 8 ft. in rebuilding after a storm in 1764, and restored in 1902; present height, 226 ft. On the night of Dec. 29-30, 1940, the church, except for the tower, was gutted during the great German fire-raid on the City of London. The font, 1615, was from the old church, in which Wynken de Worde and Lovelace were buried, and Pepys was baptized. Samuel Richardson was buried here in 1761. Near by are St. Bride's and Bridewell schools and the St. Bride Foundation Institute for printers, the last-named opened in 1894. Milton lived for a time in a house in St. Bride's churchyard.

St. Brieuc. Town of France. The capital of the dept. of Côtes-du-Nord, it stands on the left bank of the Gouet, about 2 m. from the Atlantic Ocean, 93 m. E. of Brest. The cathedral of S. Guillaume, belonging to the 13th century but rebuilt in 1864, contains two frescoes by Gouézou. There are iron and steel works and manufactures of shoes and agricultural implements, and a trade is carried on in grain, butter, honey, and cattle. The town grew round a monastery founded by a Welsh missionary, S. Briocus, in the 5th century. It was captured by the Chouans in the Vendéan War, 1799. Pop. 36,674.

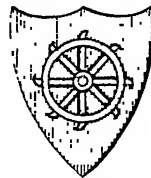
St. Brieuc Bay. Indentation on the N. coast of France. It is a wide bay of the English Channel in the dept. of Côtes-du-Nord, Brittany; the mouth between Cape Fréhel and the Pointe de Plouzeuc exceeds 30 m. across. The river Gouet enters the head of the bay.

St. Budeaux. Suburb of Plymouth, Devon. About 4 m. N. of the city, it has a rly. station and is the terminus of the ferry to Saltash, in Cornwall, across the Tamar. Pop. 1,819.

St. Catharines. A city of Ontario, Canada, the capital of Lincoln co. It stands on the Welland Canal, near Lake Ontario, 13 m. N.W. of Niagara, and is a station on the C.N.R., while an electric rly. connects it with Port Dalhousie on the lake. It is the centre of a fruit growing district, and textiles and paper are manufactured. It has a plentiful supply of electric power, and natural gas is found. Pop. 34,599.

St. Catharine's. College of Cambridge university. It was founded in 1473 as Katharine Hall

by Robert Wodelarke, chancellor of the university and provost of King's. None of the original



St. Catharine's College arms

buildings remains, the college having been rebuilt and restored between 1674 and 1876, when the master's lodge was erected. The hall was restored in 1895. John Bradford, the Protestant martyr; Edwin Sandys, deprived of office for espousing the case of Lady Jane Grey; Lightfoot; Strype; Edward Capell, the Shakespearian editor; and Shirley, the dramatist, were members of the society, which consists of a master, 12 fellows, and 26 scholars, and a varying number of undergraduates—320 in 1948. The college is familiarly known to Cambridge men as "Cat's."

St. Catherine's Hill. Chalk hill, 255 ft. high, lying 1 m. S. of Winchester, England. A story connected with this hill concerns a 15th century Wykehamist who, left at school during the holidays, occupied himself first in writing verses which became the school song, Dulce Domum, and then in carving out of the turf on St. Catherine's Hill a large cross. Every new boy at Winchester must run up the hill round a certain deep trench, find his way blindfold through some trees, and climb up Chalk Pit, take out a piece of chalk, and carry it to the cross.

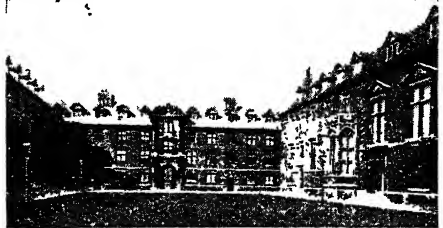
There is another hill of the same name at Guildford, Surrey, on which stand the ruins of S. Catherine's chapel, with walls dating from the 14th century.

St. Catherine's Point. Most southerly point of the Isle of Wight, in the English Channel. At this landmark is a lighthouse, 136 ft. above the sea, which has an intensity of 15,000,000 candlepower, being nominally visible from a distance of 18 m.

St. Catherine's Society. Institution of Oxford university. In 1868 the statutes which confined the university to members of a college or hall were relaxed, and there came into being a body of students who, except that they lodged in the city, were in every way members of the university. They are under supervision of a delegacy; their head is called the

censor, and they have a dean and a staff of lecturers. Scholarships and exhibitions are provided. In 1936 buildings by Hubert Worthington, including a dining hall and common room, were opened in St. Aldate's by Lord Halifax.

St. Chamond. Town of France. In the dept. of Loire, it stands on the Gier, at the foot of Mont Pilat, 7 m. N.E. of St. Étienne. It is a well-built town, with a medieval château and an aqueduct, now in ruins, which conducted the water of the Janon to Lyons. There are coal mines, iron foundries, oil wells, and silk ribbon, nail, and boot fac-



St. Catharine's, Cambridge. Quadrangle of the college, showing the hall on the right

ories. The public gardens contain a monument to Carnot, the work of Vermaire. Pop. 14,820.

St. Christopher. One of the Leeward Islands, W. Indies, more commonly called St. Kitts (q.v.).

St. Clair. Lake of the U.S.A. and Canada. It receives the overflow of Lake Huron by the St. Clair river and outflows by the Detroit river into Lake Erie; the state of Michigan, U.S.A., lies to the W., and Ontario prov., Canada, to the E. Its level is 6 ft. below that of Lake Huron, and 3 ft. above that of Lake Erie. The N. end is shallow, but a navigable channel is maintained among the mud flats of the St. Clair delta; the greatest depth is 21 ft.

St. Claude. Town of France. In the dept. of Jura, it lies in a deep gorge at the junction of the Bienne and Tacon rivers, 19 m. N.W. of Geneva. The 14th century Gothic cathedral of S. Peter is noted for its beautiful choir stalls, the work of Jean de Vitry. The industries include the manufacture of snuff-boxes, toys, and pipes. The town grew up around a monastery built in 430 by S. Romain. This was dissolved in 1742, when the town became a bishopric. Pop. 10,749.

St. Clement Danes. Former London church, at the E. end of Strand, W.C.2. It was built on a site reputed to have been the burial ground of Harold Harefoot and other Danes. The build-



St. Clement Danes, London. The church on an island site in the Strand, virtually destroyed in air raids of the Second Great War

ing, erected in 1681 from designs by Wren, was probably the third on the site. Its interior had an ornate ceiling, adorned with the royal arms, and much good carving, particularly on the pulpit (ascribed to Gibbons). The tower, 115 ft. high, was added by Gibbs in 1719. Samuel Johnson attended the church; in the N. gallery was his pew, marked by a tablet, and his statue (life size) by Percy Fitzgerald is outside the N.E. wall. With the exception of the tower and outer walls, the church was destroyed by German air raids during 1940-41. Reconstruction began in 1949. The saint's name occurs in the nursery rhyme Oranges and Lemons, whose tune the bells chimed, and an annual orange-and-lemon service for children was instituted in 1920.

St. Cloud. Town of France. It stands on the left bank of the Seine, just W. of Paris, in the dept. of Seine-et-Oise. Reached by railway and steamboat, it is chiefly notable for its park and as a pleasure resort. In the park was a palace, built about 1600 by a duke of Orléans. This became a favourite residence of Napoleon I and other rulers, and here several memorable incidents took place, including the emperor's marriage to Marie Louise and the ordinances of 1830. At St. Cloud is the porcelain factory where the famous Sèvres ware is made. The church is modern. The place owes its name to a monkish grandson of Clovis who

was buried here. An annual fair is held in the park. In 1871 the Prussians burned the palace and did considerable damage to the park and town. Pop. 17,614. *See* Fountain illus.; Sèvres.

St. Cloud. City of Minnesota, U.S.A., the co. seat of Stearns co. It stands on the Mississippi river, 64 m. N.W. of Minneapolis, and is served by rlys. The buildings include a Roman Catholic cathedral, a state normal school, and the Minnesota state reformatory. Granite is quarried and sent all over the U.S.A. Between 1858 and

de Blois, to provide accommodation for 13 poor men. The present buildings, erected by Cardinal Beaufort in the 15th century, consist of the apartments for the inmates and a magnificent church standing round a quadrangle. The church is cruciform, and contains some fine Perpendicular work. The master's house is modern. The inmates wear a peculiar costume, similar to that worn in Henry VI's reign, and there is a traditional dole of bread and beer for every wayfarer who applies for it. *See* Almshouses; Winchester.



St. Cross Hospital, Hampshire. A view from the park showing W. end of the church, the brothers' quarters, the hall, and Beaufort tower. *See* also p. 237

1906 St. Cloud was the seat of the U.S. land office, which allotted 160 acres free to each applicant who undertook to stay five years and make reasonable improvements. St. Cloud was settled in 1852, incorporated in 1868, and became a city in 1889. Pop. 24,173.

St. Cloud, ORDINANCES OF. Name given to some laws suddenly promulgated at St. Cloud by Charles X of France and his ministers, July 26, 1830. They placed the press under a strict censorship, suppressing the chief liberal papers; diminished the number of electors by raising the property qualification; and ordered elections to be indirect, not direct as heretofore. The chamber of deputies was dissolved. The ordinances caused the so-called July revolution in Paris, which led to the abdication of Charles X.

St. Cloud Ware. Semi-transparent paste of a yellowish tinge. Produced at the royal factory at St. Cloud, France, 1697-1773, it was decorated with painted flowering plants under glaze, and later with painting and gilding over glaze. The pieces were mostly in the Oriental style.

St. Croix. West Indian island belonging to the U.S.A., better known as Santa Cruz (*q.v.*).

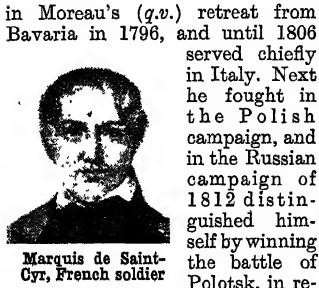
St. Cross. Hospital or almshouse, 1 m. S. of Winchester, Hants. It was founded in 1131 by Bishop Henry

St. Cyr. Village of France, in the dept. of Seine-et-Oise, 14 m. N.W. of Paris. Louis XIV founded a seminary here for impoverished daughters of the nobility, at the instigation of Madame de Maintenon, who supervised it from 1686 to 1717, and to whom there is a memorial in the chapel. Napoleon I in 1806 transformed this into the famous military school for infantry and cavalry cadets. A gunnery branch was later instituted.

Saint-Cyr, LAURENT GOUVION, MARQUIS DE (1764-1830). French soldier. Born at Toul, April 16, 1764, he first came into prominence



St. Cloud Ware. Jug and cover decorated with conventional design Victoria & Albert Museum, Kensington



Marquis de Saint-Cyr, French soldier

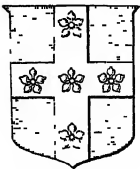
in Moreau's (*q.v.*) retreat from Bavaria in 1796, and until 1806 served chiefly in Italy. Next he fought in the Polish campaign, and in the Russian campaign of 1812 distinguished himself by winning the battle of Polotsk, in recognition of which he was made a marshal. After the overthrow of Napoleon he made his peace with the new regime, was minister of war in 1815, and was created a marquis in 1817. Author of valuable memoirs, he died March 17, 1830.

St. Cyran, JEAN DU VERGIER DE HAURANNE, ABBÉ DE (1581-1643). French Jansenist. Born at Bayonne, he studied at Louvain, and formed a close friendship with Jansen (*q.v.*). In 1620 he became abbé of St. Cyran, and in 1633 director of Port-Royal (*q.v.*). His influence alarmed Richelieu, who caused his arrest in 1638, and he was a prisoner at Vincennes for four years. One of the chief figures in the history of Jansenism (*q.v.*), he published *Théologie Familiale*, 1642, and his *Lettres Chrésiennes et Spirituelles* appeared posthumously in 1649. He died in Paris, Oct. 11, 1643.



Abbé de St. Cyran, French Jansenist

St. Davids. City of Pembrokeshire, Wales, 1 m. from the N. side of St. Bride's Bay and 15 m. W.N.W. of Haverfordwest. It derives its name from the patron saint of Wales, who founded the see and died here in 601. Its earlier Roman name was Menevia. The Gothic cathedral



St. Davids arms

is the biggest church in Wales. Begun in 1180 and added to at various dates down to the 16th century, it was restored by Scott, 1862-78. Bishop Gower's palace (1342) and S. Mary's College (1377) are interesting ruins, and near the former are remains of an ancient camp. Formerly attracting many pilgrims, St. Davids is now a mere village, the smallest cathedral city in Great Britain, though it has be-



St. Davids, Pembrokeshire. The Gothic cathedral viewed from the south-east

come a summer holiday centre. St. David's Head (100 ft. high), 3 m. N.W., is the most westerly point of Wales. Pop. 1,600.

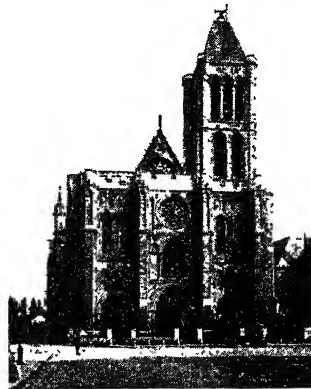
St. Denis. Capital of Réunion, a French island in the Indian Ocean. It is situated on the N.W. coast and has an exposed roadstead. The chief harbour is now Pointe des Galets, 11 m. to the W.S.W. Pop. est. 30,000.

St. Denis. Town of France, in the dept. of Seine. It stands on the right bank of the Seine, near the

wines, and brandy. The wharves form part of the river port of Paris. The town owes its origin to S. Denis, bishop of Paris and patron saint of France, to whom a tomb was erected on this spot about 240. Dagobert I replaced it by a church, round which grew the modern town. In 1871 it was bombarded by the Germans, but capitulated after the armistice in that year. Pop. 69,939.

St. Denys. Suburb of Southampton, Hants. On the N. side of the city, it has a rly. station. It owes its name to a priory (of which some remains exist) founded here in 1124 and dedicated to S. Denys. See Southampton.

St. Dié. Town of France. In the dept of Vosges, it lies in a wooded valley on the Meurthe, 50 m. S.E. of Nancy. The cathedral of S. Deodatus is of various dates from the 11th to 18th centuries. There is an obelisk erected to Stanislaus Leszcynski, duke of Lorraine, who rebuilt the town after the fire of 1757, and a monument to Jules Ferry, a native. Among the industries may be numbered tanneries, engineering, cotton, and paper works, and trade is carried on in timber, grain, and cattle. Named after S. Deodatus or Dieudonné, who founded a monastery here about 660, it became a town in the 12th cent.



St. Denis, France. The famous church of St. Denis, and burial place of the early French kings

Canal de St. Denis, 4 m. N. of Paris, of which it is a suburb. The famous early Gothic church of S. Denis is rich in historic and architectural interest. It was the burial-place of most of the kings of France from 638. During the Revolution many of these tombs were rifled. Between 1806 and 1847 its restoration cost £290,000. There are flour and cotton mills, chemical, textile, and dye works, and engineering industry. A trade is carried on in fruit, vegetables,

St. Dizier. Town of France. In the dept of Haute-Marne, it stands on the right bank of the Marne, here navigable, 39 m. S.E. of Châlons. It is a centre of the iron industry, and also carries on a trade in grain and timber. St. Dizier was known in the Middle Ages as St. Desirius, after a bishop of Langres, who was martyred towards the end of the 3rd century. When Charles V invaded France



St. Dié, France. West front of the cathedral of S. Deodatus

it was besieged for two months, the governor of the town capitulating owing to a forged letter. It was added to France by the peace of Crépy, 1544. It figured in the Marne battles of the First Great War. Pop. 19,532. See Marne, Battles of the.

St. Dunstan's. British institution for the training and care of men and women blinded through war service. Founded by Sir C. A. Pearson



St. Dunstan's badge

in the Inner Circle, Regent's Park, London. Here, eventually, every man blinded in the First Great War "learned to be blind," being trained to overcome his disability as far as was humanly possible in both work and play. By the 1930s over 2,000 had been settled in their own homes and were being assisted in the running of their own businesses. Occupations found to be particularly suitable were those of massage and telephone operating, in addition to the more usual joinery, boot-repairing, and other handicrafts. Many became poultry farmers. All received help and encouragement from the St. Dunstan's after-care department. A hostel

and training centre was opened at Brighton in 1918, though the administrative headquarters remained for many years in Regent's Park in one of the original training workshops.

Shortly before the Second Great War a new hostel at Ovingdean, Brighton, was opened; but this was evacuated during the war, a temporary training centre being opened at Church Stretton, Shropshire. By the end of 1945 over a thousand ex-service men and women blinded in the Second Great War had passed through this centre; but it was expected that this number would be more than doubled in the years to follow, as experience after the earlier war

had shown that blindness from war wounds was often delayed for many years.

Following the death of Sir C. A. Pearson in 1921, Capt. (later Sir) Ian Fraser, himself one of the earliest war-blinded men to be trained at St. Dunstan's, became chairman of the executive council. The present headquarters is at 9, Park Crescent, London, W.1. The institution is closely affiliated to similar institutions in the various British dominions, some of which (e.g. S. Africa, New Zealand) bear the name St. Dunstan's. Consult Victory over Blindness, Sir C. A. Pearson, 1919; Whereas I Was Blind, Sir I. Fraser, 1942; and St. Dunstan's annual reports.

Sainte-Beuve, CHARLES AUGUSTIN (1804-69). French critic. He was born at Boulogne-sur-Mer,

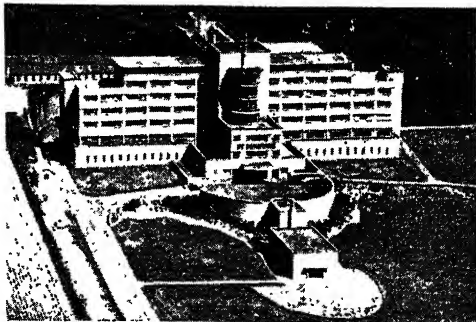
Dec. 23, 1804, three months after the death of his father. His maternal grandmother was English. Educated at Boulogne until he was 14, he then studied at the Lycée Charlemagne, Collège Bourbon, and the school of medicine, Paris. He became a contributor to a new paper, *Le Globe*, started in 1824. His friendship with Victor Hugo led to his conversion to the romantic school, evidenced by his collections of verse, *Vie, Poésies, et Pensées de Joseph Delorme*, 1829; *Les Consolations*, 1830; and *Pensées d'Août*, 1837; and by his *Tableau de la Poésie Française au XVIIe Siècle*, 1828.

Influenced by Roman Catholicism and Saint-Simonism in turn, he abandoned both, broke with the romantics, and gave up verse for the work of historian and critic. The semi-autobiographical novel, *Volupté*, appeared in 1834. His lectures at Lausanne, 1837, on Port-Royal, formed the nucleus of his first important work, *L'Histoire de Port-Royal*, 5 vols., 1840-48. Appointed librarian of the Mazarin Library, 1840, and an Academician, 1845, he was compelled by the revolution of 1848 to resign his office as librarian and go to Liège university, his lectures here being published in 1860 as *Chateaubriand et son Groupe Littéraire*. After the events of 1851, he was professor in the Collège de France, and spent 1857-61 at the École Normale. Made a senator in 1865, he died in Paris, Oct. 13, 1869.

Sainte-Beuve was the greatest literary critic of his time, and his criticisms and appreciations, collected in *Premiers Lundis*, *Causeries du Lundi*, *Nouveaux Lundis*, etc., are of permanent value. His *Critiques et Portraits Littéraires* were published in 1836-39; *Chroniques Parisiennes*, 1843-45; *Portraits de Femmes*, 1844; *Portraits Contemporains*, 1846; *M. de Talleyrand*, 1870; *Souvenirs et Indiscrétions*, 1872; *Lettres à*



C. A. Sainte-Beuve, French critic

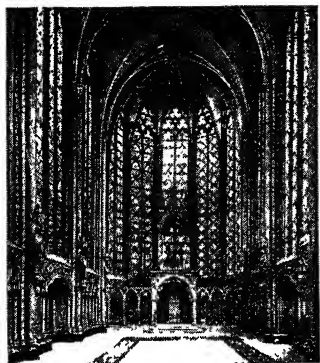


St. Dunstan's. The hostel at Ovingdean, Brighton, opened in 1918

la Princesse, 1873; Les Cahiers de Sainte-Beuve, 1876; Étude sur Virgile, 1878; Lettres, 4 vols., 1877-80.

Bibliography. Sainte-Beuve, J. Levallois, 1872; S.-B., Sa Vie et Ses Oeuvres, O. d'Haussonville, 1875; Confession de Sainte-Beuve, L. Nicolardot, 1882; Lettres à De Musset et à Sainte-Beuve, G. Sand, 1897; Études sur Sainte-Beuve, G. Michaut, 1905; S.-B., Mott, 1925.

Sainte-Chapelle. Old palace-chapel in Paris. In the precincts of the palais de justice, it was built



Sainte-Chapelle, Paris. Interior of the upper chapel, showing the wooden canopy over the shrine. Right, the exterior with its Gothic spires

in 1245-48 by Pierre de Montreuil, as a shrine for the sacred relics (Crown of Thorns and piece of the true Cross) brought from the Holy Land by Louis IX in 1239. A beautiful example of Gothic architecture, the lower chapel or crypt was set apart for the domestics, the upper for the court. The gilded spire was added in the restoration begun in 1837. Notable features of the upper chapel are the 13th century stained glass, rose window, richly decorated choir stalls, Louis XI's private oratory, and the wooden canopy over the shrine in which the relics reposed before they were transferred to Notre Dame. Between the buttresses are 15 windows of exquisite stained glass, illustrating the legend of the Cross and other Biblical subjects. Against the pillars are statues of the twelve apostles, and a number of saints and martyrs are represented in medallions around the walls. The Mass of the Holy Ghost was formerly held annually in the Sainte-Chapelle on Oct. 16.

Sainte-Claire Deville, ÉTIENNE HENRI (1818-81). French chemist. He was born in the W. Indies, March 11, 1818, and successively occupied the chairs of chemistry



at Besançon, 1845-51; École Normale, 1851-59; Sorbonne, 1859-81. He investigated problems in inorganic chemistry, becoming famous through his work on reversible reactions, during which he discovered nitrogen pentoxide, and to help in which he invented a hot and cold tube later known by his name. He also carried out work which had valuable applications in the commercial preparation of platinum and aluminium. He died July 1, 1881.

St. Edmund Hall. The only surviving ancient hall of the university of Oxford. It was founded probably in 1226, and owes its name to S. Edmund Rich, archbishop of Canterbury, who taught in a house on the site. The buildings are in Queen's Lane, and the hall was closely connected from 1553 with Queen's College, which had the right of nominating the principal, until in 1937 the hall became an independent body with a quasi-collegiate constitution.

St. Elias. Volcanic mt. of N. America. Situated in Alaska, close to the Canadian frontier, it has a snowclad summit, reaching 18,024 ft. On its

south declivity, facing the sea, is the great Malaspina glacier, 1,200 sq. m. in extent. The first ascent was made in 1897 by the duke of the Abruzzi.

St. Elmo's Fire. Bluish glow or brush-like discharge of electricity which may be seen on the masts and yards of ships exposed to the intense electric fields of thunderclouds. Similar discharges are seen on projecting objects on mountain slopes during stormy weather. The phenomenon is due to a stream of ions of the same electrical sign as the charge, induced upon the point of the conductor. It may be imitated in the laboratory by bringing a sharp-pointed object, e.g. a darning needle, near a charged Leyden jar. The name, originally used by seamen, is a corruption of S. Ermo, the popular rendering of S. Erasmus, patron saint of sailors in the Mediterranean. When an aircraft flies into a strong electric field, it tends particularly to concentrate the electric force at the nose, propellers, wing tips, and aerial, and the first stage of electrical discharge which sets in is S. Elmo's Fire. A lightning discharge may develop between the aircraft and the air. Although brush discharges are almost harmless, they serve to indicate regions of abnormal field strength. Only weakly luminous in daylight, at night they may, though occurring on the outside, be sufficiently bright to light up the interior of an aircraft. See Lightning.

St. Eloi. Village in W. Flanders prov., Belgium. It is 2 m. S. of Ypres. Throughout the First Great War St. Eloi was the scene of incessant local fighting, some of which was linked up with larger battles, e.g., Neuve Chapelle, Ypres. Two minor battles there were those of March, 1915, and March-April, 1916. The first was the Germans' reply to Neuve Chapelle,



St. Edmund Hall arms



St. Edmund Hall, Oxford. Quadrangle and hall



Saintes, France. A general view showing the church of S. Eutrope, and the remains of the Roman amphitheatre in the foreground

and on this occasion the Canadians first met the Germans in actual battle. Severe casualties were incurred in an indecisive action. The second battle began on March 27, 1916, the British taking the offensive. Intermittent fighting continued until on March 30 the Germans counter-attacked in force, and for days a swaying fight went on between them and the Canadians, who were holding the positions attacked. On April 19 the Germans attacked at St. Eloi and elsewhere around Ypres, recapturing territory, though the village remained in the hands of the British. In this battle the Germans lost several thousand men.

St. Émilion. Town of France. In the dept. of Gironde, it stands on an eminence overlooking the Dordogne, 20 m. E. of Bordeaux. Important in medieval times, it has an interesting rock-hewn church and ruins of ecclesiastical edifices. St. Émilion is noted for its wine, stronger and fuller than Médoc, resembling Burgundy, and gives its name to a brand produced by a group of communes bordering the Dordogne.

Ste. Odile. Nunnery of Bas-Rhin dept., France. It was founded in the 7th century by S. Odilia, the patron saint of Alsace. According to tradition she was the daughter of the duke of Alsace, was born blind, and gained her sight at baptism. Her tomb is in the abbey church, which is a place of pilgrimage. The nunnery is centrally placed on the hill of Ste. Odile, which rises to about 2,800 ft. N.W. of Barr; the summit is wooded, and was surrounded by a prehistoric wall of sandstone blocks, 6½ ft. thick and from 6 to 10 ft. high; parts of it still stand. See Alsace.

Saintes. Town of France. In the dept. of Charente-Inférieure, it stands on the left bank of the

Charente, 28 m. S.E. of Rochefort. It contains many Roman antiquities, including a triumphal arch, erected in the reign of Nero to the memory of Germanicus, now in the Place Bassompierre, and the remains of an amphitheatre. The cathedral of S. Pierre has a beautiful 16th century portal. There are iron and copper foundries and a trade is carried on in grain, wine, and brandy. It was anciently the capital of Saintonge. In 850 it was destroyed by the Normans, and here in 1242 Louis IX. defeated Henry III. of England. Pop. 23,441.

St. Etienne. Town of France, capital of the dept. of Loire. Situated on the Furens, 36 m. S.W. of Lyons, it is a mining and manufacturing centre, owing its importance to the coal found in

the vicinity, and has developed almost entirely since 1850, though it had some industry as early as the 14th century.

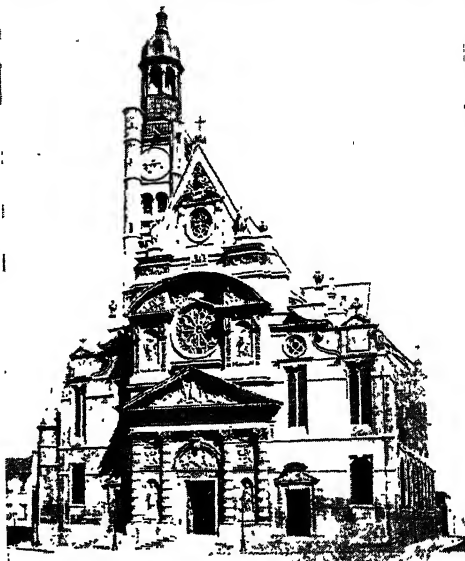
It manufactures silk, ribbons, velvets, and other textiles, and other industries are the making of ironmongery, bicycles, etc. Before 1914 St. Étienne arms the government had a small-arms factory here, and during the First Great War this was enlarged, other establishments of like kind sprang up, and the town became important by its output of munitions. Since that time it has developed many manufactures, e.g. of machinery, bicycles, trucks.

The buildings of the town are modern, except the 14th century church of S. Étienne, from which the town is named. There is an important school of mines, an hôtel de ville, and many military institutions. Pop. 177,966.

St. Etienne-du-Mont. Old church in Paris. In the heart of the Quartier Latin, N.E. of the Panthéon, it occupies the site of a church built in 1220 as part of the abbey of Ste. Geneviève, founded by Clovis in 481-511. The existing Gothic-Renaissance structure dates from the period 1517-1626, and was dedicated Feb. 25, 1626. In one of the chapels is the tomb of Ste. Geneviève, whose remains were removed here when the abbey church was destroyed in 1801.

Other features are the delicately carved *jube*, or rood loft enclosing the choir; the wooden pulpit supported by a statue of Samson; stained glass, paintings, organ loft, rose window, and stone porch, the first stone of which was laid by Marguerite de Valois. Archbishop Sibour was assassinated here by Abbé Vorger, 1857.

St. Eustache. Noted church of Paris. Cruciform Renaissance, standing at the end of the rue de Montmartre, it was begun in 1532 and consecrated 1637. Restored after a fire in 1844,



St. Étienne-du-Mont, Paris. West front of the famous church in the heart of the Quartier Latin

the interior is remarkable for its loftiness and grace, and contains some beautiful stained glass, frescoes, statues, etc. Colbert and La Fontaine were buried here. It was also the scene of a funeral service over the body of Mirabeau. The Feast of Reason, 1791, took place in this church, which occupies the site of a 13th century chapel dedicated to Ste. Agnes.

St. Eustatius OR **ST. EUSTACHE**. Island of the Netherlands W. Indies. It is one of the smaller islands in the Leeward group, 12 m. N.W. of St. Kitts. A symmetrical volcanic cone rises to 1,905 ft. Tobacco and cane sugar are the chief products. Oranjestad (Orangetown), the chief town, is on the S.W. coast. Its area is 7 sq. m., and it forms part of Curaçao. Pop. 1,092.

Saint-Évremond, CHARLES MARGUETEL DE SAINT-DENIS, SEIGNEUR DE (1610-1703). French

author. Born in Normandy, April 1, 1610, he had an active and distinguished career in France both as soldier and courtier. He fell into disgrace in 1661 and fled to England, where he passed the rest of his life. His polished wit is shown to greatest advantage in his *Comédie des Académiciens*, while his criticism, e.g. *Sur les Poèmes des Anciens*, is remarkable for its singularly modern tone. He died Sept. 29, 1703, and was buried in Westminster Abbey. *Consult* Saint-É.: étude, G. Merlet, 1870; and *Sainte-Beuve's* *Causeries du Lundi IV*, and *Nouveaux Lundis*, XIII.



Seigneur de Saint-Évremond, French author

St. Florian. Augustinian monastery in Austria. Situated 3 m. from Emmis, it was founded by the Benedictines about 700, and passed before 1100 to the Augustinians. The present buildings, mainly erected about 1700, are on a very extensive scale. The library has contained many valuable MSS.

St. Francis. River of the U.S.A. It rises in the S.E. of Missouri and flows S. for 450 m. to join the Mississippi near Helena. It is navigable for 150 m. The lower course is through a swampy area, which acts as a regulator for the floods of the Mississippi.

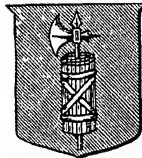
St. Francis Xavier, UNIVERSITY OR. Canadian university at Antigonish, Nova Scotia. Originally a R.C. college founded in 1855, it became a university in 1866, and received a new charter in 1909. It

is controlled by the R.C. Church, but there are no religious tests. In addition to classics, literature, law, etc., there are courses in engineering, and the buildings include a library and laboratories.

St. Gall (Ger. *St. Gallen*). Canton of N.E. Switzerland. It is bounded E. by Austria and Liechtenstein, from which it is separated by the Rhine, S. by the canton of Grisons, and touches the lakes of Constance on the N. and Zürich on the W. It surrounds the canton of Appenzell, and contains Lake Wallen. Mountainous in the S., its culminating point is Ringelspitze, 10,665 ft. Mount Saentis (q.v.), in the middle of the canton, reaches 8,215 ft. The mountain slopes are well wooded, and there are large tracts of pasture land, orchards, and vineyards.

Muslin and embroideries are manufactured in the N. section and largely exported to the U.S.A. Sandstone and slate are quarried, and there are mineral springs at Ragatz and Pfäfers (q.v.). Formed in 1803, the canton's present constitution dates only from 1890. It was the scene of the labours of S. Gall in the 7th century, and the abbots of St. Gall held a petty sovereignty over the dist. till the 19th century. Area, 777 sq. m. Pop. 286,201.

St. Gall. City of Switzerland, capital of the canton of St. Gall. It stands on the left bank of the river Steinach, 9 m. by rly. S.W. of Rorschach (q.v.) and 52 m. by rly. E. of Zürich.



St. Gall arms

The abbey church of its famous monastery, restored 1756-68, was made a cathedral in 1846. The abbey library contains over 30,000 vols., and some of the oldest and most precious MSS. in the world. There are also a Protestant church, ethnological museum, picture gallery, a town library, and industrial museum. The old monastic buildings house the great library and the central office. One of the most important industrial cities of Switzerland, it manufactures linen, woollen, and cotton goods, laces, embroideries, fine muslins, etc. The city originated from a cluster of cottages built round a Benedictine abbey, which enclosed the cell of S. Gall, an Irish hermit, who lived here from 614 to 640. It was one of the chief centres of learning in Europe from the 8th to the 10th century. Pop. 62,530.



St. Gall, Switzerland. Town and cathedral, formerly the abbey church

Saint-Gaudens, AUGUSTUS (1848-1907). American sculptor. He was born in Dublin, March 1, 1848, of mixed French and Irish parentage, and was taken to New York when six months old. He began his career as a cameo cutter, then studied at the Cooper Institute, the National Academy, and the Beaux Arts, Paris (1867-70). He was president of the Society of American Artists, honorary member of the English Royal Academy, the friend of R. L. Stevenson, of whom he executed a memorable bust, and the sculptor of the Farragut statue in New York and the Lincoln statue at Chicago, a replica of which is in Parliament Square, Westminster. He died Aug. 3, 1907.

St. George, GULF OF. Wide semicircular opening of the Atlantic. It indents the S.E. shore of Argentina, between the territories of Chubut and Santa Cruz. It penetrates inland about 120 m., and is 150 m. wide.

St. George's. Capital and administrative centre of Grenada, Windward Islands. It is on the W. coast of the island. It contains the residence of the governor. There is a radio station to maintain communication with Barbados, and the port handles export trade in bananas, lime oil, and raw cotton.

St. George's Channel. Channel separating Ireland from Wales, and connecting the Irish Sea with the Atlantic Ocean. It extends for about 100 m. N. to S., and varies in breadth from 50 m. to 90 m.

St. George's Day. Feast day of St. George. Held on April 23, the

date of his martyrdom, it used to be kept in England as a day of great pageant and festivity, a council held at Oxford in 1222 commanding that it be made a public holiday. The Royal Society of S. George holds an annual dinner. Until the beginning of the 19th century people of fashion wore blue on S. George's Day, the origin of which is unknown. See George, S.

St. George's Fields. Formerly an open space in London, between Lambeth and Southwark. Named after the church of S. George the Martyr, which stood a little S. of Southwark Cathedral, it formed the centre of three Roman ways. The fields were a noted place of public assembly, associated with Wat Tyler, Jack Cade, and the Gordon rioters. Gerard here collected specimens for his Herbal, and here, on ground now covered by the Imperial War Museum (in the building formerly Bethlem Hospital), stood from 1642 until 1811 the building known as the Dog and Duck tavern, or St. George's Spaw (Spa).

St. George's Hall. Former London hall of entertainment in Langham Place, W.1. It adjoined the former Queen's Hall (q.v.) and was built in 1893. Concerts and recitals were given until in 1905 it became the h.q. of Maskelyne and Devant's conjuring entertainments. Taken over by the B.B.C. in 1934 for broadcast variety shows given before an audience, the hall was destroyed in the German air raid on May 10, 1941.

This is the name also of a public hall in Liverpool, a notable example of architecture in the Greco-Roman style, completed in 1854, and faced with a portico of 16 Corinthian pillars 60 ft. high.

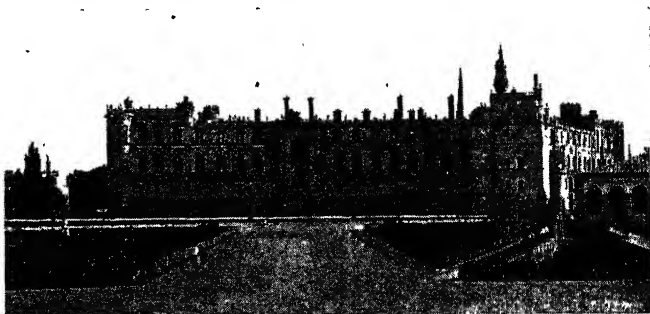
St. George's Hospital. London hospital. Founded in 1734 and incorporated by Act of parliament 1834, it has 476 beds, of which 139 are at the branch hospital at Wimbledon. There is a good medical school attached to the hospital. John Hunter was appointed surgeon to the institution in 1768, and died within its walls, Oct. 16, 1793. The build-

ing is at Hyde Park Corner, London, S.W. In association with it are the Royal Dental Hospital, the Princess Beatrice Hospital (88 beds), and the Victoria Hospital for Children (114 beds).

St. Germain, COMTE DE (d. c. 1784). Adventurer of disputed origin. He was by some believed to be the natural son of the queen of Charles II of Spain, and came to the French court from Germany

543, originally dedicated to S Vincent, and a burial place of the Merovingians. The choir and apse date from the 12th century, the porch from the 17th. The church, restored early in the 19th cent. is notable for its well of St. Germain, and marble slabs in memory of Boileau, whose heart was buried here in 1819, and of Descartes.

St. Germain-en-Laye. Town of France. In the dept. of Seine-



St. Germain-en-Laye, France. The 16th century château from the north-east

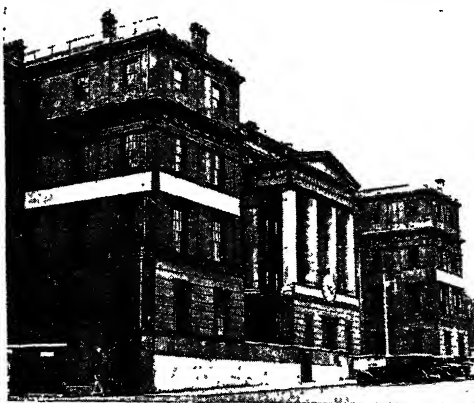
in 1748. He claimed extraordinary powers of alchemy, and declared that he had lived 2,000 years, and had known Francis I. He lived in London, 1760-62, and was in St. Petersburg, 1762. A teacher of Cagliostro, he engaged in magical practices with the landgrave Karl of Hesse, and probably died in Schleswig-Holstein about 1784. Consult Historical Mysteries, A. Lang, 1904; The Comte de St. Germain, J. Cooper-Oakley, 1928.

St. Germain-des-Prés. A church in Paris. Situated at the corner of the Boulevard St. Germain and the rue Bonaparte, and dating from the 11th century, it belonged to the abbey of Saint-Germain, which was founded in

et-Oise, it is situated on the summit of a hill which overlooks the left bank of the Seine and the forest of St. Germain, 13 m. W. of Paris. The town dates from the 10th century, and grew round a convent in the forest, then known as Ledia. It became a royal residence in the time of Louis VI. In 1370 Charles V began the château where James II sought refuge after his expulsion from England. The forest of St. Germain, on the borders of the Seine, is one of the largest forests in France, over 10,000 acres, with a circuit of 21 m. Pop. 22,013.

St. Germain-en-Laye, TREATY OF. Treaty signed between the allied and associated powers and Austria, Sept. 10, 1919. It was the complement of the treaty of Versailles (q.v.), and settled the territorial and political status of Austria following the First Great War. Its complete text was handed to the Austrian delegates on July 20, and it was ratified by the Austrian assembly on Oct. 17.

It recognized Austria as a republic and fixed its boundaries. Austria recognized the independence of all territories which formed part of the former Russian empire, and accepted the annulment of the Brest-Litovsk treaty and of all treaties or agreements concluded since the Revolution of 1917 with all governments or political groups on territory of the former Russian empire. Austria further agreed to respect the rights of all peoples

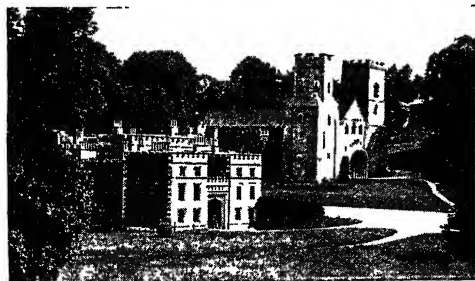


St. George's Hospital, London. The main entrance, seen from Grosvenor Place

within her boundaries. The army was limited to 30,000 men; all warships had to be surrendered to the Allied powers, and no naval or air forces were allowed. Other clauses provided for the restoration of jewels and paintings carried off by the house of Hapsburg and other dynasties from Italy, Belgium, Poland, and Czechoslovakia.

St. Germain - L'Auxerrois. Church in Paris. Standing on the Place du Louvre, it was founded in the 7th and rebuilt in the 12th-16th centuries. It is Gothic in style, and its W. façade has a rose window, two turrets, and porch. From its bell-tower the signal was given for the massacre of S. Bartholomew's Day, 1572. On the right of the entrance is a chapel with a Tree of Jesse (*q.v.*). The gargoyles without and the stone carving within are notable; there are modern wall paintings and some beautiful coloured glass of the 15th century. In the nave is a *banc d'oeuvre* of carved oak by Mercier. The name comes from S. Germanus, bishop of Auxerre, in the 5th century.

St. Germans. Village of Cornwall, England. It stands on Lynher Creek, an arm of Plymouth Sound, being 9 m. by rly. W. of



St. Germans, Cornwall. Parish church and Port Eliot, the seat of the earl of St. Germans

Fifth

Plymouth. The chief building is the beautiful church of St. Germans; it has a Norman front, the remainder being mainly Perpendicular work. St. Germans was in the 10th and 11th centuries the see of the bishop of Cornwall. It had a priory, and markets and fairs were held in the Middle Ages. Lynher Creek is sometimes given the name of St. Germans river. Pop. est. 2,000.

Close to the church is Port Eliot, seat of the earls of St. Germans. John Eliot was created an earl in 1815, and in 1942 Montague Charles Eliot (b. May 13, 1870) became the 8th earl.

St. Gervais. Church in Paris. Standing E. of the hôtel de ville, on the site of a 6th century church rebuilt in 1212, the present structure is mainly of 13th-15th century work. In 1616, Louis XIII laid the first stone of the façade, which exhibits the Doric, Ionic, and Corinthian orders, with triangular pediment and arch. The church, which is cruciform, contains many fine frescoes, a copy of Rubens' Descent from the Cross, some magnificent candelabras, and a cross of gilt bronze. On Good Friday, March 29, 1918, the Germans shelled it, seriously damaging it and killing or injuring over 150 worshippers.

St. Giles's, CRIPPLEGATE. Old London church, in Red Cross Street, E.C. Late Perpendicular in style, it was founded in 1090 by Alfune, first hospitaller of S. Bartholomew's Hospital. It was repaired 1360, partly destroyed by fire in 1544, several times restored or added to but unroofed in the great German air raid of Dec. 29-30, 1940, standing almost in isolation among the destroyed buildings around. Its name is derived from its proximity to a

"crepel" or gate in the old London wall, a bastion of which is in the churchyard where was Crowden's Well, famous for its healing properties.

During the Great Plague the burials in the churchyard rose to 800 a week. Milton, Sir Martin Frobisher, John Foxe, and John Speed were also buried in S. Giles's. Oliver Cromwell and Nicholas Breton were both married here. Lancelot Andrewes was vicar, 1588-1605.

St. Giles's - in - the - Fields. London parish divided N. and S. by Holborn and New Oxford Street, W.C. Here, about 1101, Matilda,

queen of Henry I, founded a leper hospital, around which grew up a village, and the chapel of which, in Henry VIII's time, was made the parish church. Near the hospital was a place of public execution, where Sir John Oldcastle was hanged and burnt in 1416. Much of the squalor pic-



St. Giles's, Cripplegate, London. The damaged church, now isolated amid air-raid devastation of the Second Great War

tured by Hogarth has disappeared. New Oxford Street was built through the notorious Rookery in 1849 at a cost of £290,000, but the S. section has still poor districts. The church, on the S. of the High Street, by Henry Flitcroft, 1733, has above its gate a bas-relief, erected about 1687, and portraying the Day of Judgement. It is believed to be the work of a shipcarver. George Chapman, translator of Homer, was buried in the churchyard; and in the church Shirley, Roger L'Estrange, and Andrew Marvell.

St. Gotthard or **St. GOTHARD.** Group of mountains, pass, and rly. of Switzerland. The mountains form a division of the Lepontine Alps, spreading into the four cantons of Grisons, Uri, Ticino, and Valais, and hold the sources of the Rhine, Rhône, Reuss, and Ticino. Among the chief peaks are the Sasso or peak of St. Gotthard, 8,235 ft. high; Pizzo Rotondo, 10,489 ft.; Monte Prosa, 8,983 ft.; Piz Lukmanier, 9,115 ft.

The St. Gotthard is crossed by one of the oldest and most famous of the Alpine passes (6,935 ft.) from Switzerland to Italy. The route, which leads from Lake Lucerne to Lake Maggiore, was opened as a pass practicable for pack animals early in the 13th century. Soon it surpassed in importance all the other passes in

the central Alps. During 1820-32 it was widened and made available for carriages. The hospice on the summit is first mentioned in 1331. It was partially destroyed by an avalanche in 1775, and wholly destroyed by the French in 1799-1800. Rebuilt in 1834, it was burnt in 1905, and again rebuilt. The St. Gotthard rly., from Lucerne to Milan, tunnels the range near Goeschenen in Uri and emerges above Airolo in Ticino. The rly., built in 1872-82, reaches an alt. of 3,786 ft., and the maximum gradient is about one in four. In places the ascent is made by means of spiral tunnels, of which there are seven. The whole line has 80 tunnels, 324 bridges of more than 32 ft. span, and many smaller ones. The main tunnel, 28 ft. wide by 21 ft. high, is $9\frac{1}{4}$ m. long. The whole region is strongly fortified. Louis Favre, the engineer of the tunnel, died in it on July 19, 1879. The St. Gotthard rly., which is now electrified, was purchased by the Swiss government in 1909. Right through Switzerland, from



St. Gotthard. The Alpine pass, near Giornico, showing three lines of railway, one above the other

Basel in the N. to Chiasso (near Como) the line is double-tracked. Over it run the heaviest electric locomotives in the world. See Devil's Bridge.

St. Gregory the Great. Papal order. It was instituted by Pope Gregory XVI, 1831, as a reward for services to the Catholic Faith. The badge is a red Maltese cross with white edge and gold knobs; on the circular centre, within a golden band inscribed "S. Gregorius Magnus" (on reverse: "Pro Deo et Principe"), is a golden bust of the saint on a blue field. For civil merit the cross is surrounded by a green wreath of olive; for military service, by a golden trophy of arms. The ribbon is red with a yellow border.

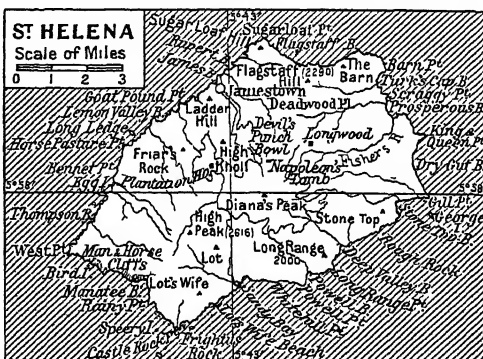
St. Helena.

British island in the S. Atlantic, an Admiralty coaling station. It is 800 m. S.E. of Ascension Island, 1,200 m. from the nearest point of Africa, and 1,500 m. N.W. of Walvis Bay. Of volcanic origin, the island is rugged, and rises to 2,700 ft. in the high hills in the S.W.; the coast cliffs vary from 600 to 2,000 ft. sheer from the sea. The original forest has disappeared, but fruit trees, eucalyptus, Norfolk pines, and cedars do well. Flax (phormium) is grown, and hemp production was increased during the Second Great War. Cattle thrive, but in the comparative absence of shipping there is no outside market for the meat. Potatoes are grown, but flax, tow, rope, and twine are the main exports, and there are nine flax mills in operation.

Administration is by a governor, assisted by an advisory council of six. At the chief place, Jamestown, on the N.W., is an observatory, and a cable and wireless station, connected with Cape Town and St. Vincent. Area 47 sq. m. Pop. est. 4,710.

A Portuguese sailor, João da Nova, discovered the uninhabited island in 1502. He named it St. Helena, and some of his countrymen were its first inhabitants. Soon, however, it was again deserted, but from time to time travellers,

Thomas Cavenish among them, visited it. The Dutch occupied the island about 1645, but remained only a short time. Its next possessor was the British E. India Co., who built Jamestown, named after James, duke of York. The company cultivated



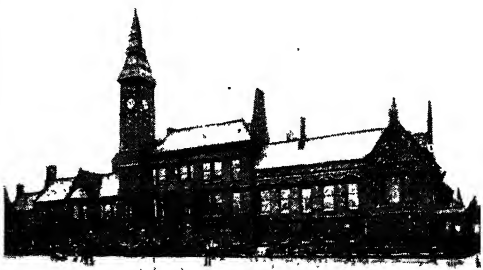
St. Helena. Map of the British island in the Atlantic, where Napoleon was imprisoned and died

the land by means of slaves, and the island was prosperous. In 1815 the British government took it over in order to make it the home of Napoleon, who died here in 1821. It was then returned to the E. India Co., but in 1834 it became the property of the crown. Meanwhile the slaves had been freed, but the island remained a port of call, until the mid century.

Boer prisoners were interned here during the S. African War; the garrison was withdrawn in 1906. In the Second Great War, while the Mediterranean route was closed, it was a port of call for shipping to and from India and the Far East. See Jamestown; Longwood; Napoleon. Consult St. Helena, 1502-1938, P. Goss, 1938.

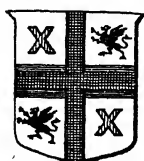
St. Helena Bay. Bay of Cape Province, S. Africa. In the western coast and N. of Saldanha Bay, it receives the Great Berg river.

St. Helens. County borough and market town of Lancashire, England. It stands 11 m. E. of Liverpool, and is served by rlys. The public buildings include the town hall and the Gamble Institute,



St. Helens, Lancashire. Town hall, built in 1873
Valentine

a technical school. The public parks include Victoria, Taylor, Queen's, and Sutton. The town is the chief centre of the glass manufacture ;



St. Helens arms

other industries are pottery and making patent medicines. Iron is worked, and around are extensive collieries. St. Helens developed into a commercial centre in the 19th century, was made a bor. in 1868, and a co. bor. in 1888. It sends one member to parliament. The council owns several housing estates. Pop. est. 105,880.

St. Helens. Easternmost suburb of the borough of Ryde, Isle of Wight, England. Incorporated with that town in 1933, it stands on the coast and is an attractive village. It takes its name from that of a church which was pulled down about 1800 because of the encroachments of the sea. The tower of the church, however, still stands.

St. Helen's, GREAT. Ancient London church. Dedicated to the mother of the emperor Constantine,



Great St. Helen's, Bishopsgate. Tower and west entrance of the London church

it stands in a close on the E. side of Bishopsgate (q.v.), E.C., and has been several times restored. The oldest parts belonged to the church of a Benedictine nunnery founded about 1210. This nunnery occupied what was later St. Helen's Place. The church has two parallel naves, divided by an arcade with six lofty pointed arches, and two chapels, also with pointed arches. The N. nave, separated from the other in pre-Reformation times by a screen, is known as the nuns' choir; the other was for the parishioners. The

oldest part includes an arched doorway, which led to the nunnery, and a squint (q.v.). Among its many monuments are altar tombs in memory of Sir Thomas Crosby and his wife, Sir William Pickering, Sir Thomas Gresham, and Sir Julius Caesar. The Shakespeare memorial window was the gift in 1884 of an American. The refectory of the nunnery, destroyed in 1799, a fine hall with panelled ceiling, served for a long time as the hall of the Leathersellers' Company (q.v.).

St. Helier. Seaport, market town, and capital of Jersey. It stands on the S. side of the island and the E. side of St. Aubin Bay, and is the terminus of the bus services. It has regular steamboat communication with Southampton and ports in France, also air service to Southampton and Northolt. The town has a good harbour, protected by a breakwater, and its chief industries are agriculture and catering for tourists. The public buildings include the parish church, partly of the 14th century, the court house, the *salle des états*, where the Jersey legislature meets and Victoria College, a public school. There are a town hall, museum, public library, theatre, cinemas, and post office.

Quite near St. Helier is Elizabeth Castle, built during the reign of Elizabeth for the protection of the town. There Charles II and Clarendon lived during their exile. Fort Regent, another defence work, dates from 1806. In 1781 there was a fight in the market place between the French and the English, the French being beaten. The incident is described by Sir Gilbert Parker in *The Battle of the Strong*. St. Helier, which is named after the patron saint Helerius, attracts many visitors in summer. Pop. 30,000. See Jersey.

St. Helier. Municipal housing estate in Surrey, England. It is situated between Mitcham and Sutton, 9½ m. S. of London, and is served by bus and tube rly. to Morden. The L.C.C. developed the estate between 1930-36. Pop. approx. 40,000.



Lord St. Helier, British judge

Oxford, and was called to the bar at the Inner Temple, in 1868. His first important case was *Tichborne v. Lushington*, 1871-72, in which he was a counsel for Sir Roger Tichborne. Having won a high reputation, chiefly in ecclesiastical cases, Jeune was appointed judge of the probate, divorce, and admiralty division, 1891, and president the following year. He resigned in Jan., 1905, when he was created a peer, and died April 9. His only son had predeceased him.

St. Hilda's College. College for women at Oxford university. Founded as St. Hilda's Hall, by Dorothea Beale (principal of Cheltenham ladies' college) in 1893, it was incorporated in 1926 under the style at the head of this article. The first principal was Mrs. Burrows. The number of undergraduates is about 150. Open scholarships and exhibitions are awarded; other scholarships are confined to candidates from Cheltenham ladies' college.

St. Hugh's College. College for women at Oxford university. It was founded in 1886 as St. Hugh's Hall, and incorporated as St. Hugh's College in 1926. Its first principal was C. A. E. Moberly, 1886-1915. In the Second Great War it was a military hospital.

St. Hyacinthe. City of Quebec, Canada. It stands on the Yamaska river, 35 m. W. of Montreal, near the U.S. border, and has stations on the C.P.R. and C.N.R. It has an R.C. cathedral, and other churches, and its chief industries are the making of boots and shoes, agricultural implements, biscuits. Pop. 17,798.

Saintine, XAVIER BONIFACE (1798-1865). French story writer and dramatist, whose real name was Joseph Xavier Boniface. He was born in Paris, July 10, 1798, at 21 gained the Academy prize for a poem, *Le Bonheur de l'Étude*, and in 1823 published a volume of poems. In 1836 appeared

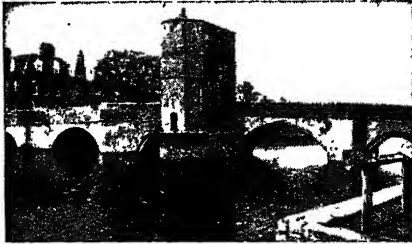


Xavier Saintine, French writer

the tale of Picciola on which his fame mainly rests. It gained for its author the Montyon prize, and at once became widely popular, the first of many English translations appearing in 1837. Besides stories and romances, Saintine also wrote plays, generally over the pen-name of Xavier, and frequently in collaboration with Scribe and others. He died Jan. 21, 1865.

St. Helier, FRANCIS HENRY JEUNE, BARON (1843-1905). British judge. Born March 17, 1843, at St. Helier, Jersey, he was educated at Harrow and Balliol College,

St. Ives. Mun. borough and market town of Hunts, England. It stands on the Ouse, 6 m. E. of



St. Ives, Huntingdonshire. The old bridge with its medieval chapel

Huntingdon, and is served by rly. The chief building is the 15th century church of All Saints. There is an agricultural trade and important cattle markets are held. St. Ives was named after a 6th century missionary. Slepe Hall, in which Cromwell lived 1631-36, has been pulled down. An old bridge crosses the river, and on it is a 15th century building, originally a chapel. For long St. Ives was under the authority of the abbot of Ramsey. It was made a corporate town in 1874. Pop. est. 3,000.

St. Ives. Mun. borough, holiday resort, and seaport of Cornwall, England. It stands on the W. side



St. Ives, Cornwall, borough arms

of St. Ives Bay, an opening of the N. coast of the county, 8 m. N. of Penzance, with a rly. station. The chief building in the town, which is picturesquely situated, is the 15th century church. There is a harbour with pier and breakwater. Industries are fishing, boat building, light engineering, and clothing manufacture. There are good sands and bathing. An ancient town, it is named after an Irish princess, Ia or Hia, who lived in the 5th century. It became a port under a portreeve, and from 1558 to 1885 was separately represented in par-



St. Ives, Cornwall. The harbour of this picturesque Cornish town

liament. It had a court of pie poudre. The existing form of government under a mayor and corporation dates from 1639. In 1934 the old borough was extended to include the parish of St. Uny Lelant, which contains the modern residential area of Carbis Bay. Pop. 8,760.

St. Ives. Title of a novel by R. L. Stevenson. Thirty chapters were left by Stevenson, and the remaining six were added to complete the work by Sir A. T. Quiller-Couch; it appeared in 1897. The tale recounts the adventures in England and Scotland of the Viscount Anne de St. Yves de Kéroual, a French prisoner of war in Edinburgh Castle, who escapes and travels to the south of England to see his lady love.

St. James's, PICCADILLY. London church on the S. side of Piccadilly. It was built 1680 by Wren, funds being provided by Henry Jermyn, earl of St. Albans. The parish of St. James's was formerly part of that of S. Martin-in-the-Fields. The interior contained a marble font by Gibbons, who also executed the carved reredos, and plaster work over the altar. In a German air raid, Oct. 14, 1940, the spire disappeared and the roof was almost entirely destroyed. The early 19th century rectory and gateway were likewise destroyed. The Gibbons carvings were stored at S. Kensington Museum, and the organ, the gift of Mary, wife of William III, was also preserved. In 1946 a garden of remembrance, to honour the courage of the people of London, was opened by Queen Mary, and in 1947 reconstruction of the roof and N. wall was started.

St. James's Palace. London building, in Pall Mall, S.W. It stands on the site of a 12th century leper hospital, dedicated to S. James the Less, which Henry VIII transformed into a manor

house, at the same time enclosing the park. After Whitehall (q.v.) was burnt, St. James's palace was a royal residence, 1698-1837. Royal levées are still held here, and representatives of foreign powers are accredited formally to the court of St. James's. Mary I, Prince Henry, son of James I, and Queen Caroline, wife of George II, died here; Charles I slept here the night before his execution; and the palace was the birthplace of Charles II, Mary, mother of William III, James II, his son the Old Pretender, Mary II, Queen Anne, and George IV. William III made it his first residence in Lon-

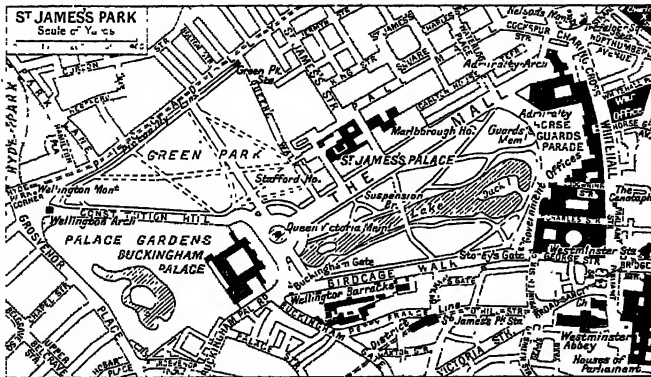


St. James's Palace, London. The Gate House, built by Henry VIII

don. In Charles II's time it was the chief residence of the duke of York, afterwards James II, and Edward VIII, while prince of Wales, made it for a time his residence.

Of Henry VIII's building, the only remains are the picturesque gateway facing St. James's Street, the chapel royal, in which Queen Victoria and Prince Albert, and the duke of York (later George V) and Princess Victoria Mary of Teck were married, and the presence chamber or tapestry room. The wing connecting the palace with Marlborough House chapel was burnt down, Jan. 21, 1809. The palace itself, and the chapel royal, were severely blasted by bombs during a German air raid Feb. 23-24, 1944.

St. James's Park. London park. It extends from Whitehall



St. James's Park, London. Plan of the park and its surroundings
Based upon the Ordnance Survey map with sanction of H.M. Stationery Office

to Buckingham Palace, includes the Horse Guards Parade, the Mall, and Birdcage Walk, and covers 93 acres. An ornamental lake of 5 acres, notable for its waterfowl, is crossed by a suspension bridge, constructed in 1857; Duck Island, at the E. end of the lake, is a breeding-place for the waterfowl. S. of Birdcage Walk, so named from the aviary kept here by Charles II, is Wellington Barracks, 1834. During the First Great War the lake was drained, as camouflage, and the site held temporary buildings used by the ministry of Shipping and the passport offices.

Charles II, in whose time the park became a fashionable promenade, greatly beautified it, calling in the aid of the French landscape gardener, Le Nôtre, for the purpose. Several of the ponds were made into a canal; later improvements were carried out during 1827-29 and in 1857. Rosamond's Pond, in the S.W. corner, filled up in 1770, was notorious as a place for duels; but in Stuart times the park was a sanctuary in which it was a serious offence to draw the sword. Palace and Park figure in Scott's *Fortunes of Nigel*, Ainsworth's *St. James's*, Thackeray's *Esmond*, and the pages of Evelyn and Pepys.

St. James's Square. London square which opens from Pall Mall and is entered N., E., and W. respectively by Duke of York, Charles II, and King Streets. Planned 1674-76 by Henry Jermyn, 1st earl of St. Albans, and the most fashionable as well as the best built square of its period, it came later to be occupied by govt. depts., clubs, and business offices. In the centre is an equestrian statue of William III. No. 1 was partly, No. 2 completely demolished by bombing during the Second Great War;

several other houses were less severely damaged. At No. 4 is the Arts Council. At No. 8 the younger Wedgwood had a show-room. Ormond House stood on the site of Nos. 9-11. No. 10, former residence of Lady Blessington, the earl of Chatham, the prime minister Derby, and Gladstone, became, as Chatham House, h.q. of the Royal Institute of International Affairs. At No. 14, rebuilt 1898, is the London Library; at No. 16, the East India and Sports Club. No. 31 is Norfolk House, built in 1939, where the staff preparing plans for the Allied invasion of France worked from Aug., 1943, and here Gen. Eisenhower (*q.v.*) had his h.q. Jan.-March, 1944; the previous Norfolk House was put up in 1748 on the site of St. Albans House, behind which was the house where George III was born. No. 32 was built in 1820 to replace the dwelling in which Lord Chesterfield was born, and became the town house of the bishop of London.

St. James's Street. London thoroughfare connecting Piccadilly with Pall Mall, S.W.1. In 1755 described as "well inhabited by gentry," its residents have included Byron, C. J. Fox, Gibbon, Gillray, Thackeray, Waller, and Wren. In this street the duke of Ormonde was attacked by Col. Blood in 1670; and here were celebrated coffee and chocolate houses, including White's Chocolate House, which attracted the patronage of highwaymen, and St. James's Coffee House, the resort of the Whigs of Queen Anne's time. Its clubs include Boodle's, Brooks's, Carlton, Conservative, Devonshire, and White's. See Crockford's.

St. James's Theatre. London playhouse in King Street, S.W.1. It was opened Dec 14, 1835, with

a production of Agnes Sorel, under the management of John Braham. Enlarged and remodelled by Sir George Alexander, who made it London's most fashionable theatre from 1891 until the First Great War, it became noted for "drawing room" comedies and romantic plays, *e.g.* *Lady Windermere's Fan*, 1892; *The Second Mrs. Tanqueray*, 1893; *The Prisoner of Zenda*, 1896; *If I Were King*, 1902; *His House in Order*, 1906; *The Passing of the Third Floor Back*, 1908. During the Second Great War the theatre suffered bomb damage on the night of Feb. 23-24, 1944, but put on *The Wind of Heaven* in 1945. In 1948 provincial repertory companies played here. There are 1,208 seats.

St. James's Wort. Alternative name for the plant ragwort (*q.v.*).

St. Jean or St. John's. Town of Quebec, Canada, formerly called Dorchester. It stands on the Richelieu river 23 m. S.E. of Montreal, and is a station on the C.N.R., C.P.R., Central Vermont, and Delaware and Hudson rlys. The first rly. in Canada was installed here in 1836. Industries include lumbering, the making of bricks, furniture, textiles, and paper, and there is a considerable agricultural trade. Pop. 15,000.

St. Jerome. Town of Quebec, Canada, on Rivière du Nord, 33 m. N.W. of Montreal, on the C.P.R. and C.N.R. The centre of a farming and lumbering district, it has butter factories, pulp and paper mills, and sawmills. Pop. 13,314.

Saint Joan. Chronicle play by Bernard Shaw. It covers the last two years of Joan of Arc's life, from the moment when she meets Robert de Baudricourt at Vaucouleurs in 1429 to her death at the stake, May 30, 1431. Five scenes take the story up to the coronation of Charles VII after Joan's victories in the field. The climax is reached in the trial scene with Joan's triumphant declaration of her responsibility to God and not to the Church. In an epilogue she becomes the object of adulation by former persecutors and false friends. Produced at the New Theatre, London, March 26, 1924, this play became accepted as Shaw's masterpiece. Sybil Thorndike gave a brilliant performance as Joan. Translated into the chief languages of the world, the play was performed throughout Europe and the U.S.A., and had several London revivals.

St. John. One of the smaller islands of the Virgin group of the Lesser Antilles, belonging to the

U.S.A. It is situated between the islands of St. Thomas and Tortola, has an area of 19 sq. m., and yields sugar, cotton, tobacco, and bay rum. The principal settlement is Cruz Bay. Formerly belonging to the Danish W. Indies, in 1916 it was sold with St. Thomas and St. Croix by Denmark to the U.S.A.

St. John. River of N. America, in the U.S.A. and Canada. It rises in Maine, U.S.A., in the midst of a lumbering dist., and flows by a great curve, N., S.E., and S., for 450 m. before it enters the Bay of Fundy. For 80 m. it forms part of the boundary between Maine and New Brunswick, and the last 300 m. are in the Canadian province. It drains an area of 21,500 sq. m.

At Grand Falls is a vertical drop of 58 ft.; above this point 65 m. are navigable; below, small steamers navigate the 126 m. to Fredericton in the flood season. Large river steamers reach Fredericton, 86 m. upstream and 6 m. below the limit of tidewater. The chief tributaries are Aroostook, Madawaska, St. Francis, Tobique, and Nashwaak. At the entrance to St. John Harbour is a curious reversible fall, where the river flows through a gorge, $\frac{1}{4}$ m. long and 400 ft. wide, flanked by rock walls 100 ft. high. At low tide the river is 11 to 15 ft. above the sea, at high tide the sea is 8 to 12 ft. above the river, for the gorge checks the flow of water in each direction; only four times daily for about 15 mins. each time can vessels pass in and out of the harbour. The chasm is crossed by a rly. cantilever and a road suspension bridge. Above it the estuary, which receives the Kennebecasis river, exceeds in parts a mile in width. See Grand Falls.

St. John. Lake of Quebec, Canada. It is about 150 m. N. of Quebec, and the Saguenay takes its waters to the St. Lawrence. It is a shallow basin, 26 m. by 20, with an area of 350 sq. m., and is fed by various streams coming from the highlands of Quebec. The lake is noted for its small salmon, called the ouinanche, and is frequented by sportsmen. The locality has an important dairy industry.

Saint John. City of New Brunswick, Canada. Situated on a peninsula at the mouth of the Saint John river, 483 m. from Montreal, it is the winter terminus of the C.P.R., and is also served by the C.N.R. A flourishing port, it has a commodious harbour with good docks, and a regular steamer service to S. Africa, the W. Indies, etc. The city has an old fort and a

martello tower. An important industrial centre, it also serves a good mixed farming, fruit-growing, dairying, and lumber district. The municipality includes the adjacent places of North End or Portland and West End or Carleton.

Saint John was founded by the French as Fort St. Jean in 1635. It became British in 1758, but its prosperity dates from the arrival of loyalists from the U.S.A. in 1783. These called it at first Parr Town, but soon restored the earlier name of Saint John. It was not, however,



Saint John, New Brunswick. A general view of the Canadian city, looking towards the St. John river

made the capital of the province, as it was thought too near the sea to be easily defensible. Its name is always spelt in full, to avoid confusion with others of the same name.

St. John or St. John's. Capital and seaport of Antigua, Leeward Islands. It is in the N.W. of the island, built on an eminence which overlooks one of the finest harbours in the W. Indies. It has air mail and passenger services to Miami and Trinidad. Pop. 10,000.

St. John Ambulance Association. Foundation of the Grand Priory of the Hospital of St. John of Jerusalem in England. With headquarters at St. John's Gate, Clerkenwell, it provides courses of instruction in the preliminary treatment of sick and injured persons, and in home nursing and sanitation, conducts examinations, and confers diplomas. It also supplies training in ambulance work and organizes transport corps for the removal of the sick and wounded at home and abroad. Offshoots of the St. John Ambulance Association are the military hospital home reserve, brigade bearer companies, and S. John's voluntary aid detachments. During both Great Wars its work was combined with that of the British Red Cross Society. See Ambulance; Nursing; Red Cross.



St. John Ambulance badge

St. John of Jerusalem. Order of chivalry. Its exact origins are obscure, but its title came from a hospital of S. John founded at Jerusalem about 1070 by certain merchants of Amalfi, who organized themselves as a religious order of Hospitalers. In addition to vows of poverty, chastity, etc., they were obliged to aid and defend pilgrims to the holy places. They spread branches of military-religious character in most countries of Europe, the provinces of administration being known as *langues*,

Driven from the Holy Land, 1290, the order went to Limasol, in Cyprus, and in 1310 to Rhodes.

Forced from Rhodes in 1522, the knights, numbering some 4,000, went to Candia and Sicily, and settled in Malta in 1530.

Charles V granted the island to the order, and Malta remained in their hands until 1798. The order then became religious in character, its headquarters being established at Rome in 1879. Admission is restricted to those who bear 16 quarterings and profess the R.C. faith.

The English order of S. John of Jerusalem is descended from the original order, and was revived in 1834. It received a charter of incorporation in 1888, and devotes itself to organizing hospital and Red Cross work, notably the St. John Ambulance Association, which during both Great Wars worked in amalgamation with the British Red Cross Society. Its chancery is at St. John's Gate, Clerkenwell, London, E.C. Its chapter consists of 350 knights of justice and knights of grace; there are also ladies of justice, ladies of grace, and esquires. The ribbon of the order is black. See Knight-hood; Knights Templars; Malta; Red Cross; Rhodes; St. John Ambulance Association.



St. John of Jerusalem. Arms of the order

St. Johns. A river of Florida, U.S.A. It issues from swamps in Osceola and Brevard cos., and follows a N. course to the Atlantic, 20 m. below Jacksonville. It is 400 m. long and is navigable for upwards of 230 m. At Jacksonville the largest vertical lift bridge in the U.S.A. spans the river.

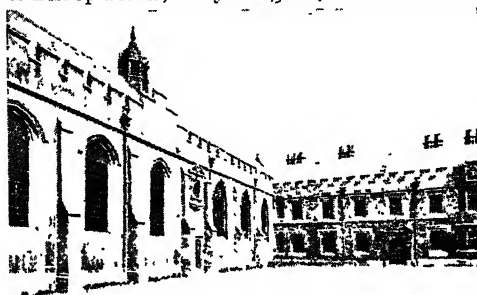
St. John's. Capital of Newfoundland, Canada. On a fine harbour on the E. coast of the island, 560 m. N.E. of Halifax, Nova Scotia, it is the largest town in Newfoundland. It has a dry dock and other accommodation for shipping, and regular steamer services to Liverpool, New York, and Halifax. It is the terminus of the island rly. line and the headquarters of the fisheries, as well as the banking and general business centre. The chief buildings are the two cathedrals, Anglican and R.C., government house, and the court house. On Signal Hill, guarding the entrance to the harbour, is Cabot Tower. The city was founded by Sir Humphrey Gilbert in 1582, and was twice seized by the French. Its harbour was used by the British fleet in the wars against America, and it was then a fortified place. The city has several times been seriously damaged by fire, the last in 1892. Pop. 62,823.

St. John's. Another name for the town in Quebec usually called St. Jean (*q.v.*).

St. John's. One of the colleges of Cambridge university. Built on the site of an Augustinian hospital, 1135, and dedicated, as was the hospital, to the Evangelist, it owes much of its prosperity to John Fisher, bishop of Rochester and executor to the Lady Margaret, countess of Richmond and Derby (1441-1509), under whose will it was founded in 1511. The first court, entered by an imposing gateway, dates from 1520, but has been much rebuilt; the second, notable for its brickwork, from

1598-1602; the third, from 1624-69; and New Court is approached, across the Cam, by a covered bridge of one arch known as the Bridge of Sighs, 1827-31.

The hall has fine panel work. The beautiful library, gift of John Williams, bishop of London, contains among other treasures an edition on vellum of the Bible of 1539. The Gothic chapel, designed by G. G. Scott, and dedicated 1869, has a decorated wooden roof, beautiful stained glass, and statues of Bishop Fisher, Lady Margaret,



St. John's College, Oxford. First quadrangle, and the hall and chapel on the right

and other benefactors. The arms of the college are the same as those of Christ's.

Among famous names associated with the college are Ascham, William Cecil, Thomas Cartwright, Robert Greene, Nashe, Thomas Fairfax, Falkland, Strafford, John Cleveland, Stillingfleet, Prior, Herrick, Richard Bentley, William Wilberforce, Horne Tooke, Wordsworth, Castlereagh, Samuel Butler, Palmerston, Sir J. Herschel, J.

Couch Adams. The society has a master, some 60 fellows, and 600 undergraduates and graduates.

St. John's. One of the colleges of Oxford university. Founded in 1555 by Sir Thomas White, an alderman of London, and a member of the Merchant Taylors' Company, it has always had

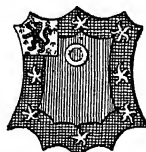
a close connexion with the Merchant Taylors' school, and some of its best scholarships are confined to boys educated there. Its head is the president. The buildings, which front St. Giles, contain remains of a house founded by Archbishop Chicheley for Cistercian students. The older parts consist of two beautiful quadrangles, the back one overlooking the garden being especially notable, while the garden is perhaps the most beautiful in Oxford. Laud, former president, built part of

the college, to which considerable additions were made about 1900. The library is perhaps the most interesting room, and the college has relics of Charles I. It owns much valuable land in Oxford. Laud, president of this college 1611, is buried in the chapel, as is Juxon. Also up at St. John's were Edmund Campion and James Shirley.

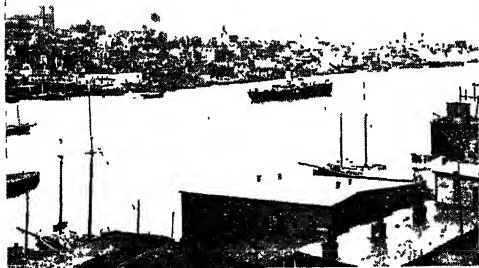
St. John's Gate. Relic of old London, in Clerkenwell (*q.v.*). An example of Perpendicular architecture, much restored, it formed the S. gatehouse of the priory of the Knights Hospitallars of the Order of S. John of Jerusalem. The priory, founded about 1145, grew immensely wealthy; it was wrecked by the followers of Wat Tyler, 1381, and, rebuilt, was dissolved in 1540. Apart from the Norman crypt and ruined parts of the adjacent church of S. John (bombed by the Germans in 1941),



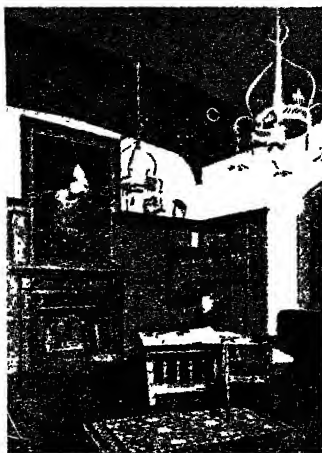
St. John's College, Cambridge. New Court, built 1826-30



St. John's College, Oxford, arms



St. John's, Newfoundland. A general view of the Newfoundland capital, looking towards the harbour



St. John's Gate, London. The interior of the council chamber. Right, the old gatehouse of the priory of S. John, Clerkenwell

the gatehouse, which was built by the grand prior, Sir Thomas Docwra, in 1504, is all that remains of the priory. In Elizabethan times a residence of the master of the revels, it was used in 1731-81 as the printing office of *The Gentleman's Magazine*. After serving as a watch-house, and then as an inn, the gatehouse became in 1874 the headquarters of the revived order of S. John of Jerusalem and of the S. John Ambulance Association. See *Hospitallers*; *consult* *The Order of the Hospital of S. John of Jerusalem*, H. W. Fincham and W. R. Edwards, 1915.

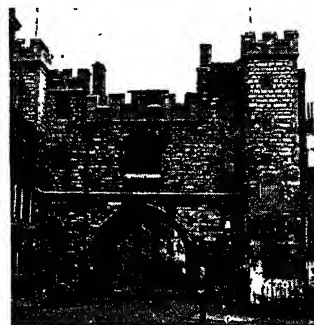
St. John's Wood. Residential district of London. In the bor. of Marylebone, and built over in the 19th century, it lies N.W. of Regent's Park. Near the station of the Bakerloo rly. are Lord's cricket ground and S. John's church, with the grave of Joanna Southcott. The district holds memories of many eminent writers and artists, including Charles and Mary Lamb, Thos. Hood, George Eliot, G. H. Lewes, Herbert Spencer, Landseer, Harold and Dame Laura Knight; but many notable houses were destroyed when the Great Central rly. was extended to Marylebone. It was once the property of S. John's Priory, Clerkenwell.

St. John's Wort (*Hypericum calycinum*)
Perennial



St. John's Wort.
H. calycinum

herb of the family Hypericaceae. A native of Europe, Asia, and N. Africa, it has slender, two-ridged, brown stems, branching above; and opposite oblong leaves whose veins are pellucid, as are the glands with which the leaf is freely dotted. On holding a leaf to the light these appear like perforations. The bright yellow flowers are an inch across, and appear in clusters at the end



of the branches. Several other species of *Hypericum* are also called St. John's Wort. See *Aaron's Beard*; *Leaf*.

St. Joseph. City of Missouri, U.S.A., the co. seat of Buchanan co. A port of entry, it stands on the Missouri river, 61 m. N. by W. of Kansas City, and is served by the Atchison, Topeka, and Santa Fé and other rlys. Among the principal features are the county court house and auditorium, the Carnegie and public libraries,

and it has one of the world's biggest meat-packing industries. Carriages, clothing, and furniture are made. Third city in the state, St. Joseph has a pop. of 75,711.

St. Just. Urban dist. of Cornwall, England. It stands near the coast, 7 m. N.W. of Penzance. The chief building is the church of S. Just, a Perp. edifice with some interesting features. In full St. Just in Penwith, the town is surrounded by ancient disused tin and copper mines. In a round, or amphitheatre, here, Cornish miracle plays were performed. About 1 m. away is Cape Cornwall. Pop. approx. 4,000.

St. Just, LOUIS ANTOINE LÉON DE (1767-94). French revolutionary. Born at Decize, Nièvre, Aug. 25, 1767, he was educated at Soissons, supported the revolutionary movement, and was elected to the assembly in 1792. Closely allied with Robespierre, he was a member of the committee of public safety, 1793, secured the confiscation of the property of refugees, and was dispatched to strengthen discipline in the Rhine armies. On his return he became president of the convention, where he urged the ideal of a Spartan republic. Fanatic and tyrant, he ordered wholesale execution of soldiers suspected of treason and secured the success of the northern armies by threatening the leaders with death if they failed. Arrested with Robespierre, he was guillotined, July 28, 1794.



St. Kilda, Scotland. The town and bay, viewed from the south

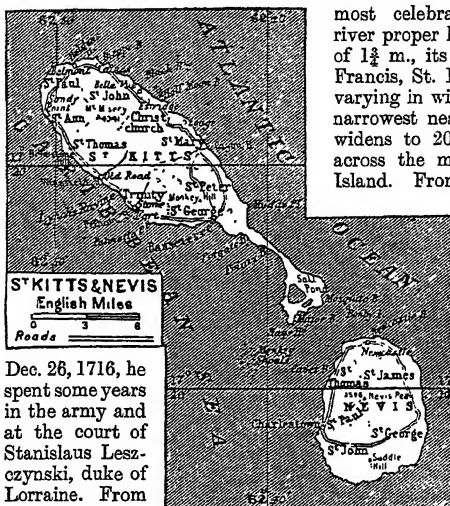
and the state hospital for the insane. St. Joseph was laid out in 1843 and chartered as a city in 1853. Its prosperity began with the opening of westward trade routes before the days of rlys.,

St. Kilda. (Gaelic *Hirta*, "the western land.") Island of the Outer Hebrides, Scotland. It belongs to Harris, Inverness-shire, and is 40 m. W. of North Uist. The chief of a group of about 17 rocky islets,

its circumference is about 7 m.; its highest point is 1,397 ft.; it has lofty, precipitous cliffs around the coast, except in the S.E., where is the landing-place. It is a sanctuary for the fulmar petrel and other sea birds, and has half-wild sheep. On May 15, 1918, a German submarine shelled the church. In 1930 the pop. of 35 with their possessions were taken off this isolated spot and mostly settled in Morven. The island belongs to the Macleod of Macleod.

St. Kilda. Watering-place of Victoria, Australia. It is 3 m. S.E. of Melbourne, of which it is practically a suburb.

St. Kitts OR **St. CHRISTOPHER.** Third largest of the Leeward Islands, in the British West Indies. It lies 46 m. W.N.W. of Antigua, and has an area of 68 sq. m. The central mountainous area, which is forested, culminates in Mt. Misery, 4,341 ft. The coastal lowlands yield sugar, molasses, cacao, limes, coffee, tobacco, coconuts, salt, and cotton. Basseterre is the chief town. With Nevis and Anguilla. St. Kitts forms an ad-



St. Kitts. Map of the West Indian island, including the adjacent island of Nevis

most celebrated waterfall. The river proper has an average width of $1\frac{1}{2}$ m., its lake expansions, St. Francis, St. Louis, and St. Peter, varying in width from 5 to 9 m.; narrowest near Quebec, it rapidly widens to 20 m., and is 100 m. across the mouth near Anticosti Island. From the Atlantic Ocean, at the Strait of Belle Isle to the head of Lake Superior, is a water stretch of 2,264 m., which is navigable with the aid of the "Soo" canals to avoid the rapids of Sault Ste. Marie and the Welland canal to avoid Niagara; ocean steamers reach Montreal 986 m. from the ocean; steamers connect the ports above

that city with each other and Montreal. The floors of Lakes Ontario, Huron, Michigan, and Superior are below sea level; the drop from Lake Superior to the ocean being only 600 ft., the river is, at least, 100 ft. deep from Quebec to the gulf.

The Richelieu, which drains Lakes Champlain and George, is the chief right-bank tributary; left-bank tributaries include the Monikagan, Outarde, Saguenay, Ottawa. The Thousand Islands fill the wide expanse where the river emerges from Lake Ontario. In the U.S.A. there has been considerable controversy regarding a suggested scheme of further improvement in the St. Lawrence waterway, whereby Montreal would be directly linked with Chicago. This scheme would by-pass the Niagara Falls and adversely affect New York traffic. See Bridge illus. p 1424. Lachine: Montreal.

St. Lawrence, GULF OF. Arm of the N. Atlantic Ocean on the N.E. coast of America. It is due to submergence of the land and has, therefore, deep channels connecting it with the ocean. It receives at the N.W. the waters of the St. Lawrence river. The Strait of Belle Isle lying between Quebec and Newfoundland, 600 ft. deep, and used by ocean steamers en route to Quebec or Montreal whenever it is free from ice; the Gut of Canso, a narrow passage between Cape Breton Island and Nova Scotia; and Cabot Strait, 60 m. in width, 1,200 ft. deep, between Cape Breton Island and Newfound-



St. Kitts, or St. Christopher, British West Indies. The water front at Basseterre, the island's most important town

ministrative unit, which sends representatives to the federal legislative council of the Leeward Islands. The three islands are



St. Kitts arms

part nominated. Discovered by Columbus in 1493, settled by English and French about 1624, St. Kitts became British in 1713, though it has been seized and held for short periods by the French since then.

Saint-Lambert, JEAN FRANÇOIS, MARQUIS DE (1716-1803). French man of letters. Born at Nancy.

St. Laurent, Louis (b. 1882).
Canadian statesman. See N.V.

St. Lawrence. River of North America. It begins as the St. Louis, which enters Lake Superior near Duluth, and has a total length of 1,900 m. Its basin includes the five great lakes; between Lakes Superior and Huron it is known as the St. Mary, between Lakes Huron and St. Clair as the St. Clair, between Lakes St. Clair and Erie as the Detroit, between Lakes Erie and Ontario as the Niagara: below Lake Ontario as the St. Lawrence.

Its basin contains more than half the fresh water in the world, and includes Niagara, the world's

land, connect the gulf with the ocean. Prince Edward Island, Anticosti, and the Magdalen Islands are within the gulf, of which the Northumberland Strait is a detached portion. About 500 m. from N. to S. and 240 m. across, its area is 80,000 sq. m.

St. Leger. British horse race. It takes place at Doncaster, normally on the Wed. of the Sept. meeting. The race was inaugurated by Col. St. Leger, of Parkhill, Doncaster, in 1776. Originally it was a sweepstake for 3-year-olds, over a course of 2 m.; the first winner was Lord Rockingham's Sampson. Afterwards the course was altered to 1 m. 6 fur. 132 yds. Horses which had previously won the 2,000 guineas and the Derby have occasionally also won this last of the classic races: West Australian 1853, Gladiateur 1865, Stockwell 1866, Ormonde 1886, Common 1891, Isinglass 1893, Galtee More 1897, Flying Fox 1899, Diamond Jubilee 1900, Rock Sand 1903, Pommern 1915, Gay Crusader 1917, Gainsborough 1918, (the last three winning a substitute St. Leger) and Bahram 1935.

St. Leonard's Forest. Tract of land in Sussex, England, to the N.E. of Horsham. It formed part of the Andredsweald of the Saxons, and was at one time in the possession of the Braose family.

St. Leonards-on-Sea. Watering-place of Sussex, England, a W. suburb of Hastings (q.v.) with its own rly. stations. There are



St. Leonards-on-Sea, Sussex. Marine Court, a notable landmark

a pavilion, a fine promenade, and an open-air swimming pool.

St. Lô. Town of France. The capital of the dept. of Manche, it stands on a rocky height on the right bank of the Vire, 60 m. S.E. of Cherbourg. An important road centre, it was destroyed during eight days' fighting, July 10-18, 1944, when it was captured from the Germans by the Americans, and by subsequent German shelling. The inhabitants, evacuated by the Germans, soon began to return and to start rebuilding, at first temporary houses. The former church of Notre Dame dated from the 15th century. The abbey of Ste. Croix was founded by Charlemagne in the 9th century. There were manufactures of lace, cotton cloths, and ribbons, and trade in butter, cider, and grain. The town, which derives its name from S. Lô, bishop of Coutances, who built a church here, suffered greatly also in the wars of religion.

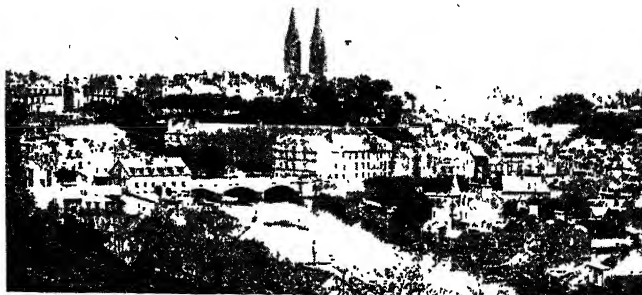
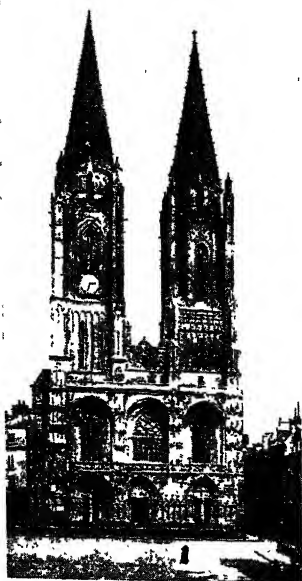
St. Louis. Principal city and port of entry of Missouri, U.S.A. The eighth largest city of the U.S.A., it is pleasantly situated on the W. bank of the Mississippi river, 10 m. below its junction with the Missouri river, and is served by

the Missouri, Kansas and Texas and several other rlys. A well-planned city of rectangular shape, it rises in a series of three terraces, respectively 20 ft., 150 ft., and 200 ft. above the river's high-water level, has a river frontage of 19 m., and covers rather more than 61 sq. m. Eads Bridge, erected 1869-74, which crosses the river here, has two storeys, the lower one carrying a rly.; four other bridges connect St. Louis with industrial suburbs in Illinois.

St. Louis has some 2,700 acres of parks, the largest being Forest Park, 1,370 acres, and the most picturesque Tower Grove Park, 267 acres, which is contiguous with the Missouri Botanical Gardens. In Washington Park is the city hall, and other notable public structures include the massive Coliseum and the chamber of commerce.

Washington university and St. Louis university are the chief institutions for higher education, and there are also the Forest Park university for women, the Normal College, the Christian Brothers' College, and the St. Louis Medical School. The public library contains nearly half a million volumes, and the mercantile library about 140,000. The principal churches are the French Walnut Street cathedral, the Protestant cathedral, the cathedral of S. Louis, and church of SS. Peter and Paul.

St. Louis's culture is partly due to 30,000 Germans, mainly of the professional and skilled artisan class, who settled there before 1850. By 1900 its pop. exceeded 500,000. Today it is one of the foremost commercial and industrial centres of America. Tobacco is the principal manufacture, upwards of 80,000,000 lb. being processed annually. Other industries include slaughtering and meat-packing, zinc and lead smelting, printing and publishing, flour-milling, and the manufacture of



St. Lô, France. Left, west front of the 15th century church of Notre Dame whose spires can also be seen in the general view, above (pre-1944)



St. Louis, Missouri. The waterfront stretching along the Mississippi

foundry and machine-shop products, clothing, boots and shoes, wagons, carriages, stoves, hardware, and bricks. An active trade in mules is carried on, and large quantities of cotton, wool, and coal are exported.

St. Louis was named in honour of Louis IX of France, by Pierre Laclède, who established a fur trading post here in 1764. It remained in French hands for several years, but passed to the U.S.A. as part of the Louisiana Purchase in 1803-04. In commemoration of the purchase an international exhibition was held here in 1904. Pop. 813,458.

Opposite St. Louis, in Illinois, is East St. Louis, which is described under that name.

St. Louis. Capital of the French colony of Senegal, Africa. Situated on the small island of Sor, at the mouth of the river Senegal, it is a busy port, and is connected with Dakar by rly. (165 m.) and with the river ports on the Senegal by steamboat, a regular service to Podov (140 m.) running throughout the year. St. Louis is the residence of the lieutenant-governor of the Senegal Colony, and is one of the four communes represented in the French parliament. Pop. 49,160.

St. Louis, EAST. This city of Illinois is described under East St. Louis.

St. Lucia. Largest of the Windward Islands in the British West Indies. It is 25 m. N. of St. Vincent and 25 m. S. of Martinique. The forested and mountainous interior culminates in an active volcano above 3,000 ft. Sugar, cacao, limes, copra, coffee, and spices are the



St. Lucia arms

chief products of the fertile valleys; logwood is obtained from the forests. Its main importance is due to the excellence of the harbour of Castries, the chief town, where there is a coaling station and a naval base. The administra-

tor is assisted by a nominated executive and a partly nominated and partly elected legislative council. The island was discovered by Columbus in 1502, was settled by the French in 1635, and became British in 1803, having been alternately French and British in the interim; French is the language spoken by the natives. Its area is 233 sq. m. In 1940 a site at Gros Islet Bay was leased to the U.S.A. for a naval and air base; a U.S. army aerodrome and military base is at Vieux Fort. Pop. 73,770.

St. Lucia Bay. Shallow landlocked lagoon on the coast of Zululand, Natal. It lies S. of Tongaland, and receives the waters of the Makusi river. At the entrance to the bay the White Umvolosi has its exit. Coal exists in the neighbourhood, and vast quantities of papyrus grow in the lagoon. St. Lucia Bay was claimed by the S. African Republic and ceded by Panda, king of the Zulus, to the British, Oct. 5, 1843. Subsequently a party of Boers, under Luca Meyer, attempted to found the New Republic there, and in 1884-85 the Germans tried to form a settlement. The bay was formally annexed by the British government, Dec. 18, 1884.

St. Luke's. London parish. In the met. bor. of Finsbury (*q.v.*), it was formed, 1732, from the parish of St. Giles's, Cripplegate. The church, 1732-33, by George Dance, sen., and notable for its tower and obelisk-like spire, was restored 1877-78. In the churchyard, now a recreation ground, were buried Caslon, the typefounder, and Thomas Allen, one of London's historians. St. Luke's gives its name to a hospital for the insane, a charity founded 1751 in Moorfields. The buildings in Old Street, by George Dance, were erected 1782-84. The hospital, incorporated 1838, was greatly added to later, a chapel being built in 1842. The buildings were later acquired by the bank of England as a printing works, and the foundation transferred its support to a hospital for nervous diseases at Muswell Hill.

St. Luke's Summer. A spell of fine warm weather popularly supposed to occur about the time of St. Luke's day, Oct. 18.

St. Malo. Seaport and watering-place of N.W. France. In the dept. of Ille-et-Vilaine, on a rocky peninsula at the mouth of the Rance, opposite Dinard, it is connected with the mainland by a sea wall, known as the Sillon. Surrounded by ancient towered ramparts, with eight gates, it has a castle built in the 14th-15th century, and at one time used as a barracks. The church, founded in the 12th century, is mainly of



St. Malo arms



St. Malo, France. The ancient town and its harbours from the air

15th-16th century work. It has a façade built in 1713, and a spire that was added in 1859.

Attached to the hôtel de ville are a library and museum, and there is a municipal casino. Motor-boats, called vedettes, connect with Dinard and Dinan; steam trams with Paramé, St. Servan, and Cancale; and steamers with the Channel Islands and Southampton. Many islets protect the harbour. Normal tides rise 23-26 ft. above low-water mark. Chateaubriand, whose grave is on a rocky eminence of the islet of Grand Bey; Jules Cartier, Lamennais, and Maupertuis were natives. Timber and coal are imported; cattle, game, and dairy produce exported; and the Newfoundland cod-fishery provides employment for many of the inhabitants, who possess seafaring traditions of long standing. Pop. 11,311.

St. Malo is named after a Welsh monk, S. Malo or S. Maclou, who was bishop here in the 6th century. In 1711 the town contributed 30 million francs to support Louis XIV in the wars of the Spanish succession, and it several times defied capture by the English, notably in 1758, when Marlborough landed at St. Servan, and wrought considerable damage, but was unable to take St. Malo. On the fortified islet of Césambre, S. Brendan founded a monastery about 524. St. Malo was in German occupation from the surrender of France in June, 1940, until 1944. On Aug. 3, 1944, U.S. armoured units, advancing from Avranches, reached St. Malo, where the encircled German garrison held out until Aug. 9, the citadel surrendering on the 17th.

St. Margaret's. Residential dist. of Middlesex, England. It is 10½ m. by rly. from Waterloo, and forms part of the urban dist. of Heston and Isleworth.

St. Margaret's. A London church. Founded as the parish church of Westminster in the first half of the 12th century, rebuilt in the 13th century, and again in 1485-1523, since April 17, 1614, it has been the official church of the house of commons. Its bells are rung on the formal admission to office of a new Speaker, baptisms in S. Stephen's Chapel are recorded in its registers, and the banns of M.P.s are here published. The dean of Westminster is usually appointed as rector of S. Margaret's. In 1916 S. Margaret's was created the parish church for the British overseas dominions. It is situated just beside Westminster Abbey,

and is a favourite church for weddings of fashionable members of London society. A remarkable example of Perpendicular architecture, it is rich in memorial win-



St. Margaret's, Westminster. The official church of the House of Commons from the Abbey green

dows and monuments. The headless body of Raleigh was buried here; the memorial window to him was the gift of Americans in 1882; the Milton window was unveiled by Matthew Arnold in 1888; both windows suffered damage in the Second Great War, as did the fine organ. The beautiful E. window, removed to safety during both Great Wars, and in the Civil War, was a gift to Henry VII by Ferdinand and Isabella of Spain, when their daughter Catherine of Aragon was married to Henry's son Arthur. Consult St. Margaret's, Westminster, H. F. Westlake, 1914.

St. Margaret's Bay. Watering-place of Kent, England. It is 4 m. from Dover, the rly. station being Martin Mill. There are golf links, and in the village, known as S. Margaret-at-Cliffe, is a Norman church restored in 1869.

St. Mark's. Cathedral at Venice, one of the most famous extant monuments of Byzantine architecture. The present structure was begun towards the end of the 10th century, and consecrated in A.D. 1094. An earlier church, built from the designs of a Greek architect, occupied the site in the 9th century.

S. Mark's is the largest of the Italian Byzantine churches, covering an area of 46,000 sq. ft., and measuring 260 ft. by 215 ft. externally. It was constructed of brick, which has since been overlaid with coloured marble, in the form of a Greek cross. The façade on the Piazza San Marco consists of two

storeys, of which the lower has the main entrance in the centre of a line of five semicircular arches, the design being repeated on a slightly smaller scale in the upper storey.

A gallery, with a balustrade, extended round the whole building, divides the two storeys. Crowning the roof is a hemispherical dome, 42 ft. in diameter; the western dome is of the same size, and there are three other domes of which the diameter is 33 ft., and several turrets. Between the 12th and 14th centuries a great deal of Italian Gothic detail was added to the exterior, and for this reason the architectural attractiveness of the building must be sought in its colour rather than in its form.

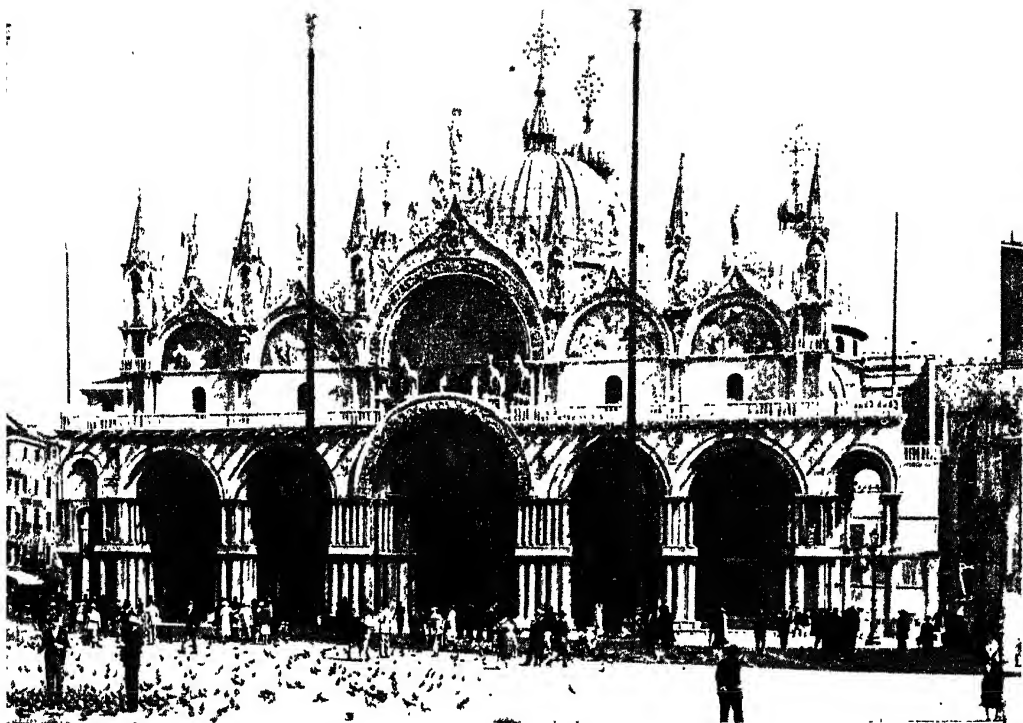
Over the middle and largest portal are four gilded bronze horses, each 5 ft. high, which originally formed part of an ancient quadriga, and probably adorned the triumphal arch of Nero. They were brought to Venice in 1204 from Constantinople by the doge Enrico Dandolo, were taken to Paris by Napoleon in 1797, but were returned in 1815.

The marble used in the fabric of the building is mostly Oriental, and there are 500 columns of this stone in the exterior and interior. Immediately over the principal entrance are modern mosaics depicting the Last Judgement, above are 17th century mosaics of incidents in the life of Christ. At the main entrance itself are some remarkable medieval allegorical sculptures. In the domes of the vestibule are some 13th century Byzantine mosaics representing O.T. scenes. The bronze doors of the cathedral date from the 11th and 12th centuries.

Within, the cathedral's chief glory is the mosaic work in the domes, dating from the 12th and 13th centuries. Remarkable also is the beauty of the pavement.

Upon the High Altar is the Pala d'Oro, only uncovered at Easter, which was made at Constantinople in 1105, and consists of enamelled work and jewels set in plates of gold and silver. Under the altar are deposited the remains of S. Mark, brought here from Alexandria in 879. The Treasury, which is reached from the right transept, contains many valuable pieces of Byzantine church furniture, a 7th century episcopal throne from Alexandria, and various ornaments brought from S. Sophia, Constantinople.

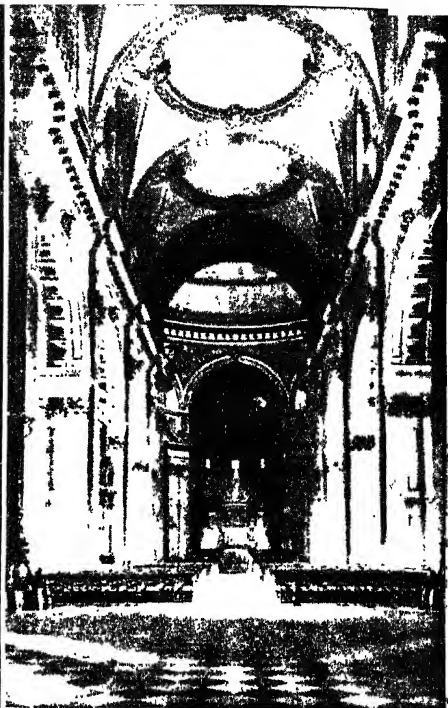
One of the features of the building is the Baptistry, which con-



ST. MARK'S, VENICE: THE WESTERN FACADE AND THE RICHLY ORNAMENTED INTERIOR

One of the great historic churches of Christendom, St. Mark's was consecrated A.D. 1094. The remains of St. Mark, brought from Alexandria, lie under the altar. The building is faced with coloured Oriental marble, contains 500 marble columns, and is famous for its glorious Byzantine mosaic work.

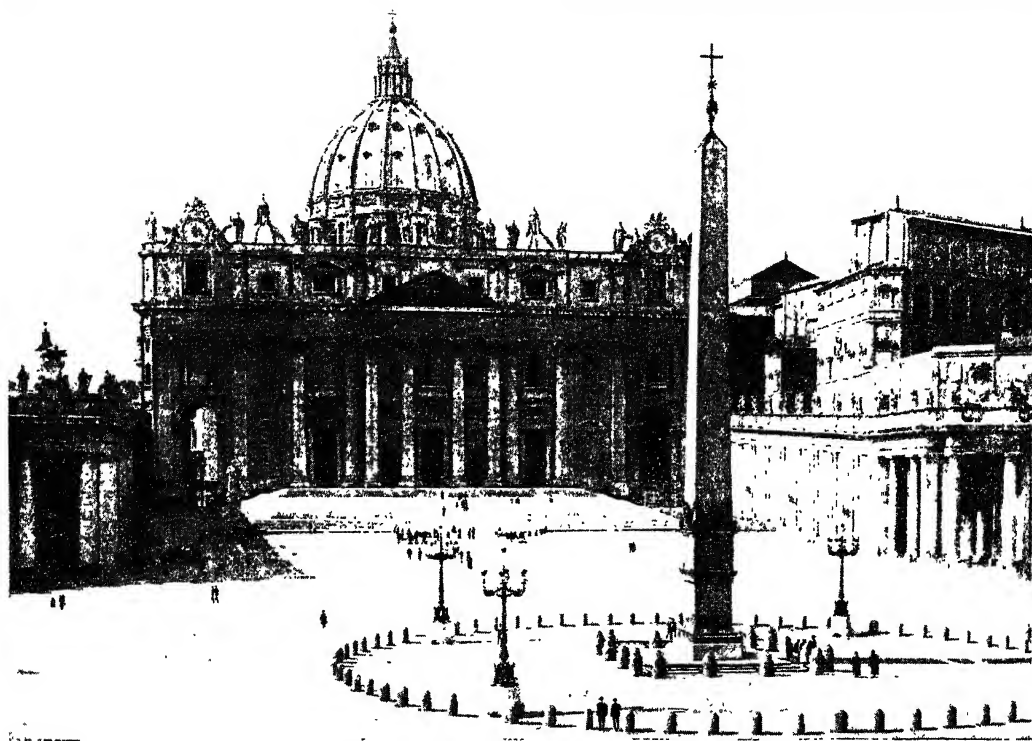




ST. PAUL'S CATHEDRAL, LONDON

The building of Wren's masterpiece, the third cathedral to be built on the site, was begun 1675 and completed 1710, at a cost of under £748,000. The pictures show the western façade, as seen from Ludgate Hill, the nave, and a post-war view from the S.E., looking across the area devastated by the German fire raid of Dec., 1940.

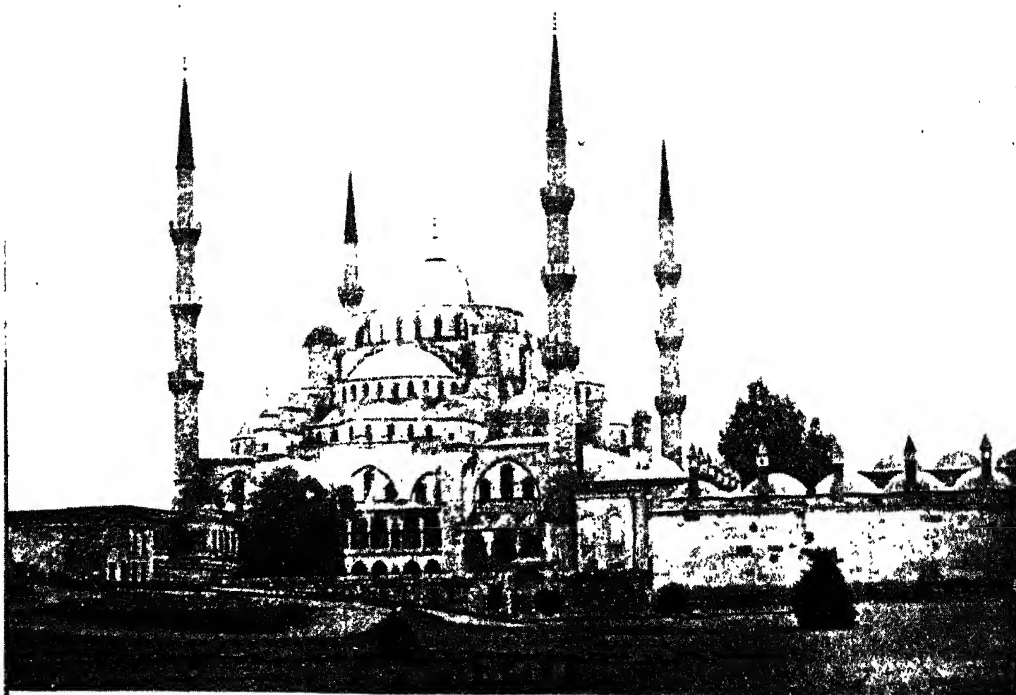




ST PETER'S, ROME: EXTERIOR AND INTERIOR OF THE LARGEST CHURCH IN THE WORLD

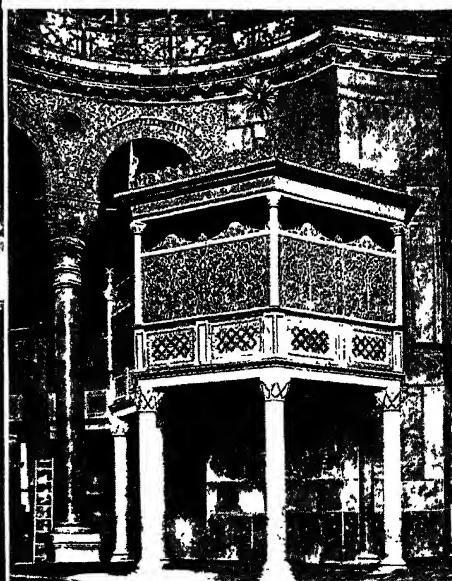
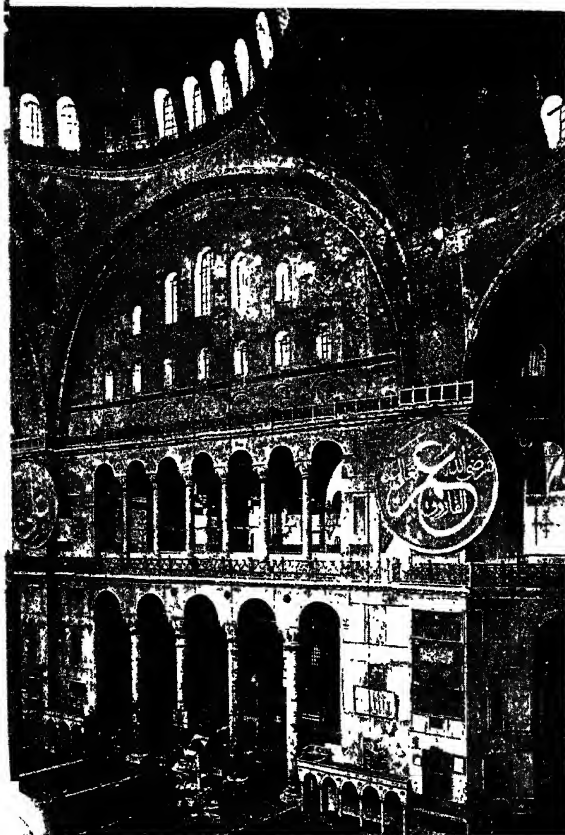
Above: the western façade built by Carlo Maderna in 1612, showing (right) the main entrance to the Vatican palace, which rises behind: the Egyptian obelisk was brought to Rome by Caligula. Below: looking towards the High Altar, which stands above the crypt containing St. Peter's tomb





ST. SOPHIA, ISTANBUL

Originally a Christian church, this beautiful Byzantine building became a Mahomedan mosque in 1453, but, apart from the addition of minarets, the structure was little altered. The large plaques in the interior view are inscribed with the names of Allah and His prophets. Below, right - the private worshipping place used by former sultans of Turkey



tains a 16th century font, the bronze lid of which is ornamented with carving. The mosaics of the ceiling are 13th century work, and there is a monument to the doge Andrea Dandolo (d. 1354). Adjoining the Baptistery is the Zeno chapel, containing the bronze monument of Cardinal Giambattista (d. 1501).

S. Mark's, which became a cathedral in 1807, was the state church of the Republic of Venice. In it the doges were crowned, and on the S.W. corner of the building there still remains the Pietra del Bando, a porphyry block from which the edicts of the republic were announced. Also on the S. side are two pedestals, which were brought from Acre in 1256.

It is of interest to note that the pigeons, so prominent a feature of the piazza by the church door, are descendants of birds liberated from the vestibule in the early days of the republic. So long as the republic lasted public funds were devoted to their maintenance. They now depend for a livelihood upon visitors. See *Byzantine Architecture*; Venice; and illus. p. 7241.

St. Martin (Du. *St. Maarten*). Island of the West Indies. It is one of the Lesser Antilles, with an area of 2,159 m., has a mountainous interior, and is lacking in water; sugar, cotton, and tobacco are produced in small quantities. The N. portion, with a pop. of 5,177, is French, and forms part of the overseas dept. of Guadeloupe; the S., with a pop. of 1,877, is Dutch and forms part of the territory of Curaçao (*q.v.*). Early French and Dutch settlers were expelled by the Spaniards, who later abandoned the island, which was occupied simultaneously by the French and the Dutch in 1648.

St. Martin - in - the - Fields. London parish, divided from that of S. Margaret's, Westminster, in 1535. On the site of a chapel of S. Martin, Henry VIII erected the parish church. This was enlarged by Prince Henry, son of James I, and the present structure, at the N.E. corner of Trafalgar Square, was built by James Gibbs in 1721-26. During the two Great Wars it was continuously open as a resting-place for soldiers, and its crypt became a canteen in the daytime and a dormitory shelter at night. In the now covered-in churchyard lie the remains of the murdered Sir Edmundbury Godfrey, John Hunter the anatomist, Robert Boyle the philosopher, Nell Gwynn, Farquhar the dramatist, Roubiliac the sculptor, and Jack Shep-

pard. At a school once adjoining the church Ben Jonson was a pupil. Before the end of the 18th century the parishes of S. Paul,



St. Martin-in-the-Fields. Facade of the London church, from Trafalgar Square

Covent Garden; S. Anne's, Soho; S. James's, Piccadilly; and S. George's, Hanover Square, had been divided from that of S. Martin-in-the-Fields. With the advent of broadcasting the church became famous throughout the world as a result of its services being frequently in the B.B.C. programmes. Successive vicars—"Dick" Sheppard, "Pat" McCormick, and Eric Loveday—became well known to listeners. Its magazine had a circulation far beyond the boundaries of the parish. See London. Consult *A Short History of the Royal Parish of St. Martin-in-the-Fields*, J. MacMaster, 1916.

St. Martin's.

One of the inhabited Scilly Islands, lying 2 m. N. of St. Mary's. Shaped like a boot, it shows remarkable contrasts with its N. and E. coasts wild and the S. and W. luxurious. Pop. 110.

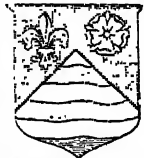
St. Martin's - le - Grand. London street, running S. from Aldersgate Street to Cheapside. Its name commemorates the church, college, and sanctuary of S. Martin that stood here from 1056 to 1548. Here is the h.q. of the G.P.O. To

make way for some of its buildings a French Protestant church and the Bull and Mouth inn were pulled down in 1888. The middle part of the street was heavily bombed in the Second Great War. See Post Office.

St. Martin's Summer. Name given in England to the period of fine weather popularly supposed to occur around S. Martin's Day, Nov. 11. See *Indian Summer*; *Martinmas*.

St. Martin's Theatre. London playhouse in West Street, W.C.2. It was opened Nov. 23, 1916, under the management of C. B. Cochran, with a production of *Houp La!* Here were played *A Bill of Divorcement*, 1921; *The Ghost Train*, 1925; *Berkeley Square*, 1926; *Shop at Sly Corner*, 1945. The theatre seats 600.

St. Marylebone. Met. bor. of London. It is bounded by Westminster (Oxford St.) on the S., Paddington (Edgware Rd.) on the W., St. Pancras and part of Holborn on the E., and Hampstead on the N. Until the 18th century it was only a village, originally called Tyburn, changing its name in 1400 with the building of the new church of S. Mary's-la-bourne, from which the present name is derived. It now includes many famous buildings and institutions, e.g. the B.B.C., Lord's cricket ground, Regent's Park (including the Royal Zoological Society's gardens), Madame Tussaud's, and the Royal Academy of Music. Harley St. and Wimpole St., centre of the medical specialists' world, come within its boundaries, and several hospitals.



Marylebone arms



St. Marylebone, London. The parish church of S. Mary, built 1813-17, standing on the S. side of Marylebone Rd.

e.g. Middlesex, Western Ophthalmic, as well as the London clinic (one of the largest nursing homes in

England). Cavendish, Manchester, and Portman Squares are noteworthy for their architecture. Marylebone station is a main line terminus, and Baker Street an important junction of London Transport. Municipal buildings include the town hall in Marylebone Road.

At the old parish church of S. John (demolished 1949), which figures in Hogarth's *Rake's Progress*, Francis Bacon (1606), Hogarth (1729), and Sheridan (1773) were married. In its graveyard were buried Charles Wesley, Allan Ramsay, the painter, and Mrs. Siddons. The present parish church was erected during 1813-17; here were married, Sept. 12, 1846, Robert Browning and Elizabeth Barrett. Residents in the borough were Dickens, George Eliot, Hallam, Gibbon, D. G. Rossetti, Haydon, J. M. W. Turner, and Faraday.

During the Second Great War many buildings in St. Marylebone were destroyed or badly damaged, e.g. the central synagogue, the Philharmonic Hall, Queen's Hall, and S. George's Hall. Pop. 87,000.

St. Mary's. Largest of the Scilly Islands. About 27 m. W.S.W. of Land's End, Cornwall, it is some 2 m. in length and breadth, and contains a number of antiquities and fine rock scenery. There are traces of a prehistoric village, and Star Castle, an Elizabethan fortress. Hugh Town, on an isthmus joining the two portions of the island, is the only town in the Scilly Islands; it has a good harbour and a pier. Spring flowers and early potatoes are grown. Pop. 1,025.

St. Mary's. Loch of Scotland, in Selkirkshire. It is 16 m. W. of Selkirk, about the same distance N.E. of Moffat, is 814 ft. in alt., about 86 ft. deep, and measures 3 m. in length, with an extreme breadth of $\frac{1}{2}$ m. It receives Megget Water from the W., and discharges into the Yarrow river at its E. extremity. At the S. end is the celebrated Tibbie Shiels inn, and to the E. is Altrieve, the cottage of James Hogg. The lake figures in the poems of Scott, Wordsworth, and Hogg.

St. Mary's. River connecting Lakes Superior and Huron. N. America. It is 65 m. in length, and is divided by large islands into two main channels which each expand at intervals to a width of 10 m. Between the two lakes the fall is 21 ft., most of which occurs in the sault or rapids, which are about 1 m. long. Since 1855 canals have made the rapids navigable. See Sault Ste. Marie.

St. Mary's Hospital. Medical institution in Praed St., Paddington, London. The hospital was founded in 1845 and the present building opened in 1851. It comprises a general hospital of 480 beds, and a medical school of the university of London. In the Clarence wing is the Wright-Fleming institute of microbiology, which was founded by Sir Almroth Wright and perpetuates his name and that of Sir Alexander Fleming, who discovered penicillin while engaged on research in the hospital laboratory.

St. Maurice. River of Canada. A left bank tributary of the St. Lawrence, it flows for 300 m. through Quebec, and joins the main stream at Three Rivers. Considerable quantities of timber are sent down the river. It is navigable for 75 m. between Grand Piles and La Tuque.

St. Maurice. Town of Switzerland, in the canton of Valais. Standing on the left bank of the Rhône, 33 m. by rly. S.E. of Lausanne on the Simplon rly., and 14 m. S.E. of the Lake of Geneva, it is famed for its abbey, originally founded by the Burgundian King Sigismund, and named traditionally after S. Maurice, commander



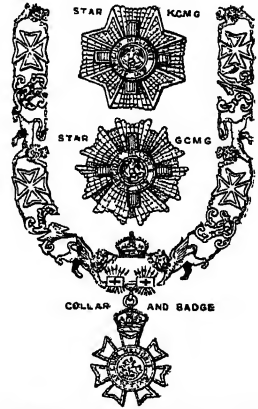
St. Maurice, Switzerland. The château and bridge over the Rhône

of the Theban Legion, martyred here about 302. The abbey has been occupied by Augustinian canons since 1128. This is a fortified town. Pop. 2,569.

St. Mawes. Small town, seaport, and summer resort of Cornwall, England. It stands on St. Mawes Harbour, an arm of Falmouth Bay, 3 m. E. of Falmouth. Its castle (1542) was captured by Fairfax in 1646. Cables and ropes are manufactured, and fishing is an active industry.

St. Michael and St. George. British order of knighthood. It was founded in 1818 especially for natives of the Ionian Islands and

the Mediterranean area. Later it became an order to reward services rendered in the British dom-



St. Michael and St. George. Collar, badge, and stars of the order

inions. Its statutes have been remodelled several times, one occasion being in 1902. The order has three grades: G.C.M.G., knight grand cross; K.C.M.G., knight commander; and C.M.G., companion. Holders of the first two are distinguished as Sir. The badge is a white cross of 14 points, having in the centre the figure of S. Michael, with sword, trampling on Satan. On the reverse is an equestrian figure of S. George with the dragon. The motto is *Auspicium melioris aevi* (augury of a better age). The ribbon is of saxe blue with crimson centre. Membership is limited to 100 knights grand cross, 300 knights,

and 600 companions, and the order has a chapel in S. Paul's cathedral. See Knighthood, colour plate.

St. Michaels or São Miguel. Largest island of the Azores group. It measures 41 m. by 9 m., and covers an area of 297 sq. m. The island is mountainous, the highest peak being 3,854 ft. alt. Ponta Delgada, the largest town, has a pop. of 21,048.

St. Michael's Mount. Precipitous rock in Mount's Bay, Cornwall, England. About 3 m. E. of Penzance, and connected with the mainland by a low-tide causeway, it rises over 200 ft., is nearly 1 m. in



St. Michael's Mount, Cornwall, from the mainland

circumference, and has at its summit a 6th century monastic castle, long the seat of the St. Aubyn family. In early times this was a place of hermitage. A chapel was founded by Edward the Confessor and affiliated with the Benedictine abbey of Mont St. Michel (*q.v.*), Normandy.

St. Mihiel. Town of France. In the dept. of Meuse, it stands on the slopes of the Côtes de Meuse on the right bank of the river. It is 11 m. N. by W. of Commercy and 20 m. S. by E. of Verdun. It has a noted Benedictine abbey, dating from the 8th century, and the churches of S. Michel and S. Étienne. Its manufactures include lace and embroidery. In the First Great War it was captured by the Germans, Sept. 25, 1914.

The recovery of the St. Mihiel salient was an American exploit. The 1st army, under Pershing, was concentrated around the salient. On the night of Sept. 11, 1918, six divisions lay along the S. side while on the N. were two more divisions, together with the 15th French Colonial corps. The attack took the form chiefly of a drive across the base from both sides simultaneously. It was delivered by Sept. 12, and by the afternoon Pershing had advanced 5 m. and captured several villages. The salient was flattened out, and Pershing took upwards of 13,000 prisoners, more than 200 guns, and immense quantities of booty.

St. Moritz. Village and watering-place of Switzerland. In the upper Engadine, in the canton of Grisons, it

stands at an alt. of 6,090 ft., the loftiest village in the Engadine, on the lake of St. Moritz, 27 m. S.E. of Coire (Chur). It is a favourite resort both for its winter sports—the



St. Nazaire, France. A view across the vegetable market towards the port, an important German submarine base during the Second Great War

Cresta Run was started in 1885, and the Olympic winter games of 1928 and 1948 were staged at St. Moritz—and for its chalybeate, sulphurous, and carbonic springs in summer. Pop. 3,963. *See* Curling.

St. Nazaire. Town of France, in the dept. of Loire-Inférieure. It stands on the right bank of the Loire, 30 m. W. of Nantes, near the sea. Before the Second Great War, when St. Nazaire was vir-

tually destroyed, it had a harbour with tidal wharf, an entrance lock to an older basin, and three dry docks independent of the tides. These docks and a large part of the quays of the old basin were government property. To make St. Nazaire the port of Nantes over £1,450,000 was spent. There were regular sailings to S. America. Trade was carried on in grain, salt, tobacco, coffee, sardines, and cognac.

In the First Great War St. Nazaire was in Aug.-Sept., 1914, a temporary base for the B.E.F. It was the chief disembarkation centre for vehicles and stores for the B.E.F. in Sept., 1940, and became one of the principal embarkation ports for the B.E.F. withdrawing from France in June, 1940. During the evacuation the transport *Lancastria* was sunk

here by a German bomber with heavy loss of life. The Germans developed the port into a base for submarines operating in the Atlantic and it was frequently raided by the R.A.F.

On March 28, 1942, British light naval craft, commando units, and the R.A.F. carried out a combined operation against the port, the principal objectives being the dry dock and harbour installations. An ex-U.S. destroyer, H.M.S. *Campbeltown*, was filled with explosives and blown up after ramming the dock gates. Landing parties destroyed the pumping station and dock-operating equipment, while the U-boat basin was damaged by delayed action torpedoes. The raiders then withdrew, having lost, killed or missing, 212 officers and men out of a force of 353. After the Allied invasion of Europe in June, 1944, U.S. forces supported by the F.F.I. invested St. Nazaire from Aug., 1944: a 12-day truce from Jan. 16, 1945, was arranged to permit evacuation of the civil population.



St. Moritz. Summer view of the Swiss resort

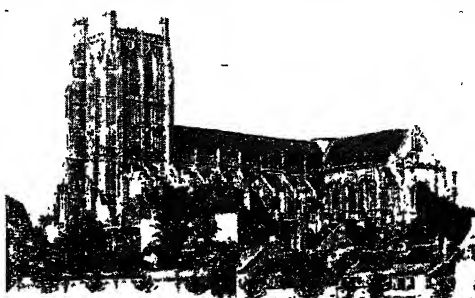
The German garrison remained in possession of the port until, after the general German surrender, it surrendered to U.S. and French forces on May 9, 1945. Pop. 11,802.

St. Neots. Urban dist. and market town of Hunts, England. It stands on the right bank of the river Ouse, 8 m. by rly. S.S.W. of Huntingdon. Named after S. Neot, whose relics were translated from Cornwall to Eynesbury, near by, in 974. St. Neots has a fine parish church and a large market place. The industries include flour milling, malt extracting, and paper making. Market day, Thurs. Pop. 4,709.

St. Nicolas. Town of Belgium. In the prov. of E. Flanders, it lies in the flat and fertile region known as the Waesland, 12 m. by rly. W.S.W. of Antwerp, and is a junction on the Antwerp-Ghent line. A prosperous manufacturing centre, it is interested in cloths, wool, cotton, and silk, hatmaking, carpets, dyeing, cigars, and chicory, and a busy agricultural trade. The 16th century church of S. Nicolas, restored 1900, and the church of Notre Dame, 1844, are noteworthy. On the market place are several buildings of interest. Pop. 43,469.

St. Ninians OR **St. RINGANS.** Parish of Stirlingshire, Scotland. It is partly within the burgh of Stirling, of which it forms a S. suburb. Coal mining and low temperature carbonisation, agriculture and the making of agricultural implements, give occupation. The battlefield of Bannockburn is about 1½ m. S.S.E. Population 14,757.

St. Omer. Town of France. In the dept. of Pas-de-Calais, it is 42 m. W.N.W. of Lille. It stands on the Aa, is connected with the sea by a canal, and has a harbour for its shipping. The chief buildings are the church of Notre Dame, once a cathedral, with objects of reverence and interest, the churches of S. Denis and S. Sepulchre, the town hall, and the court house, once the bishop's palace. The Hôtel Colbert houses a museum. A massive



St. Omer, France. The former cathedral of Notre Dame

tower 190 ft. high, damaged in the Second Great War, is a reminder of the abbey of S. Bertin. The buildings of the Jesuit college remain, although put to other uses. Boulevards have replaced the fortifications. Near St. Omer is a hydraulic lift which raises and lowers boats 40 ft. from one part of the canal to another. The town has a number of manufactures.

St. Omer is named from the saint who, about 700, founded here the abbey of S. Bertin. Another abbey was dedicated to Notre Dame, and the church of this became the cathedral when the bishopric was founded in 1559. A border town in the Netherlands, St. Omer was fortified and for it there was much fighting between the French and their foes. In 1677 it was taken by the French. It ceased to be the seat of a bishop in 1801. In 1592 the English Jesuits opened a college which existed for two centuries. From Oct. 12, 1914, to March 31, 1916, St. Omer was G.H.Q. of the B.E.F. and the place where Lord Roberts died, Nov. 14, 1914. In the Second Great War it was occupied by the Germans during their advance on Calais in May, 1940, and liberated by the British 2nd army advancing on Brussels early in Sept., 1944. Pop. 18,156.

Saintonge. Name of one of the provinces into which France was divided before the Revolution. It lay around Saintes with a seaboard on the Atlantic; its other boundaries were Poitou, Angoumois, and Guienne. About 50 B.C. it was inhabited by the Santones, and later was part of the Roman Empire. It belonged to Henry II of England, and was in English possession intermittently until the end of the 14th century. When the government of France became more centralised, Saintonge was united with Angoumois, and so remained until 1789. It is now covered by the departments of Charente and Charente-Inférieure.

St. Ouen. River port of France, in the dept. of Seine. It stands just N. of Paris on the right bank of the Seine, where there is a small harbour, and has manufactures of wool, stockings, dyes, hats, soap, etc. In the château Louis XVIII signed the declaration which formed the basis of the French constitution, May 2, 1814. The building has been replaced by a modern structure. Pop. 45,465.

St. Pancras. Met. bor. of the co. of London. Bounded E. by Islington, S. by Holborn, W. by St.

Marylebone and Hampstead, and N. by Hornsey and Finchley, it includes the districts of Somers Town, Chalk Farm, Camden Town, Kentish Town, and part of Highgate; the railway termini of Euston, St. Pancras, and King's Cross; University College, Working Men's College, and Royal Veterinary College; the open spaces of Ken Wood,



St. Pancras arms



St. Pancras parish church, Euston Road, built in 1819-22

Waterlow Park, and parts of Regent's Park, Primrose Hill, Parliament Hill Fields. St. Pancras station was opened by the Midland rly. in 1871. The station hotel became British Rlys executive offices. There are a town hall, opened 1937, and six libraries.

The St. Pancras district includes the ancient prebendal manors attached to S. Paul's Cathedral, of Pancras, Tottenham. Cantelows, and Rugmere, and the district was named after a young Phrygian, martyred in the time of Diocletian, after whom S. Augustine named the first church built at Canterbury.



St. Omer arms

The old church in St. Pancras Road, renovated in 1847-48, dates from 1180 or earlier. Seven acres of the burial ground, with the adjoining burial ground of S. Giles's, were converted into a public garden in 1877; the rest being taken by the Mid. rly. when the line into St. Pancras was under construction. Among those buried here were William Godwin and his first wife, Mary Wollstonecraft, whose remains were reinterred at Bournemouth in 1851; General Pasquale Paoli, whose body was removed to Corsica in 1889; Sir John Soane, John Flaxman, William Woollett, and many refugees from the French Revolution who settled in Somers Town. The church, which was succeeded as the parish church in 1822 by that in Euston Road (*q.v.*), contains interesting monuments. The bor. elected three M.P.s up to 1950; it now has one of its own, and shares another with Holborn. Pop. (1948 est.) 140,000.

St. Patrick. Irish order of knighthood. It was founded in 1783 by George III, after Ireland had obtained legislative independence, and its constitution was revised in 1905. It has only one class of knights distinguished as K.P. and limited to 22. They wear a collar adorned with harps alternating with double roses and double knots, the roses being alternately red within white and white within red. The badge which hangs therefrom is an oval composed of a red saltire surrounded by a green crown within a circlet of sky blue. The motto is *Quis separabit* (Who shall separate?), surrounded by a wreath of shamrock. The ribbon is light sky blue. See Knighthood, colour plate.

St. Patrick's Day. Anniversary of the death of the national saint of Ireland, March 17. On it Irish soldiers and others wear shamrock. It is omitted from the Church of England calendar. See Patrick; Shamrock.

St. Patrick's Purgatory. Islands in Lough Derg, co. Donegal, Eire. The two rocky islets, which have long been a place of pilgrimage for the devout from all parts of Europe, are known individually as Saint's Island and Station Island,

and are the legendary scene of S. Patrick's purgatory. A monastery stood on the former, but was destroyed in 1632. There is a hospice for pilgrims on Station Island, and from July 20 to Aug. 15 the islands are full of persons who perform a devotional circuit of the chapels and objects of piety.

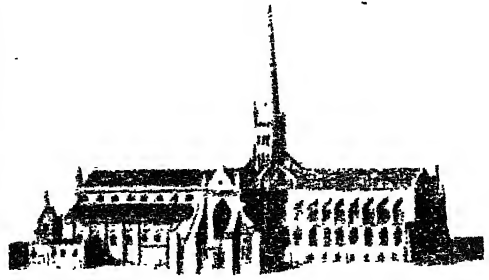
St. Paul. City of Minnesota, U.S.A. The state capital and the co. seat of Ramsey co., it stands on the Mississippi river, which separates it from Minneapolis, and is served by the Chicago, Milwaukee and St. Paul, and several other rlys. Among its prominent buildings are the state capitol, the city hall, and the R.C. cathedral. Its educational institutions include Macalester College, Hamline University, Concordia College, S. Paul's College, S. Thomas's College, S. Paul College of Law, the agricultural school of Minnesota university; and of several libraries the chief are the State law library and the Minnesota Historical Society library.

St. Paul is an important rly. and commercial centre.

There is an important cattle trade, and its horse market is the largest in the country. Printing is a leading industry, and manufactures consist largely of foundry and machine-shop products, boots and shoes, clothing, lumber products, and fur

goods. There are also meat-packing establishments and rly. repair shops. St. Paul, state capital, 1849, five years later received a city charter. John Ireland, a destitute Irish immigrant, became the first American cardinal, and settled 800 Irish immigrants on 117,000 acres of rly. land, and made St. Paul the leading R.C. diocese. Pop. 271,606. See Minneapolis.

St. Paul's. Cathedral of London. Its foundation stone was laid June 21, 1675, the entire structure being completed in 1710. It is the third cathedral church



St. Paul's, London. The second cathedral on the site, destroyed in 1688. (After Hollar)

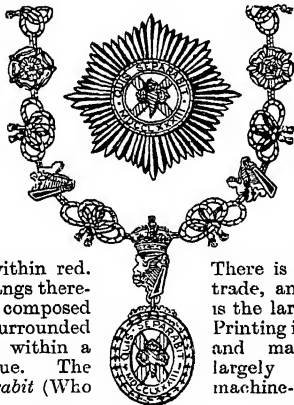
built on this site; it was preceded by a Norman building which was virtually destroyed by the Great Fire in 1666; this in its turn followed a Saxon church, which was burnt in 1086.

The present church was designed by Sir Christopher Wren (*q.v.*). A product of the late Renaissance in Great Britain, it is unique among British cathedrals as the only non-Gothic building of its class. Wren's original plan was that of a Greek cross; but the clergy stipulated that the form should be a Latin cross, with a long nave and aisles, and Wren modified the design. He lived to see his masterpiece finished, but his master-mason, Thomas Strong, who began the work, died in 1681, and was succeeded by his brother Edward. The building cost a little under £748,000.

Its central feature is the dome, crowned by its cupola and lantern with the golden ball and cross. Constructionally, the dome is two-fold, consisting of an inner and outer shell, of which the former is 108 ft. in diameter, and the latter 148 ft. The outer dome, built of timber covered with lead, rests on a brick cone, its lower portion forming the drum, of which the windows admit light to the crossing; within this dome the interior dome is built. The balustrade surrounding the drum was erected in opposition to Wren's wishes.

The two flanking towers at the W. end are crowned by cupolas. Linking the campanile towers together is the main portico, in two storeys, crowned by a triangular pediment (*q.v.*). Two broad flights of stone steps lead up to the entrance. On the N. and S. sides the two-storey construction is repeated in the semi-circular porticoes, two orders, Corinthian and Composite, being used for these.

Within the cathedral, the nave, 118 ft. in breadth, has a large western bay with the S. Dunstan's

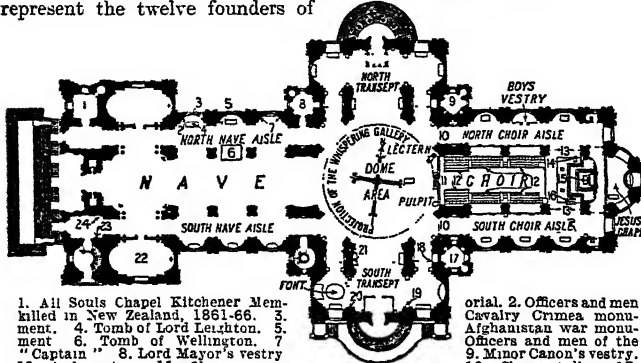


St. Patrick. Collar, badge, and star of the Irish order

chapel and the chapel of S. Michael and S. George, once used as the Consistory. The great arches with their domed roof are carried by massive piers, to which are attached Corinthian pilasters with beautiful carved capitals supporting the entablature (*q.v.*). Each aisle has three large windows. The four windows of the N. transept represent the twelve founders of

ecclesiastics like Donne and Dean Milman, scholars like Sir William Jones, all have their monuments in S. Paul's.

Among deans of S. Paul's were Donne, Sancroft, Stillingfleet, Tillotson, Sherlock, Joseph Butler, Thomas Secker, C. R. Sumner, Milman, R. W. Church, W. R. Inge, W. R. Matthews.



1. All Souls Chapel Kitchener Memorial. 2. Officers and men killed in New Zealand, 1861-66. 3. Cavalry Crimea monument. 4. Tomb of Lord Leighton. 5. Afghanistan war monument. 6. Tomb of Wellington. 7. Captain. 8. Lord Mayor's vestry. 9. Minor Canon's vestry. 10. Aisle gates. 11. Choir screen. 12. Choir stalls. 13. Screens. 14. Bishop's chair. 15. High altar. 16. Sedilia. 17. Dean's vestry. 18. Stairs to crypt. 19. Tomb of J. M. W. Turner. 20. Colonial S. African war memorial. 21. Tomb of Nelson. 22. Chapel of SS. Michael and George. 23. Coldstream Guards S. Africa memorial. 24. Coldstream Guards Inkerman memorial.

St. Paul's, London. Ground plan of the cathedral built by Wren

English Christianity, and those of the S. the first twelve English Christian kings.

Grinling Gibbons was responsible for the carved choir stalls, and the mosaics of the choir were the work of Sir W. B. Richmond. Thornhill painted the interior of the dome with scenes from S. Paul's life. Wren himself conceived the idea of decorating the cupola with mosaic, but was prevented from carrying out his scheme. The "whispering gallery" is a feature that attracts visitors. An elaborate reredos was completed in 1888 at a cost of £37,000.

The crypt (*q.v.*) of S. Paul's extends under the entire building, and contains the tombs of many men famous in English history: here are the Nelson sarcophagus, the tomb and funeral car of Wellington, the grave of Wren, and a memorial bust of Lawrence of Arabia. Statues and monuments distributed through all parts of the cathedral commemorate naval and military heroes, famous churchmen, notable engineers, scientists, and artists. Alfred Stevens's Wellington memorial, completed by John Tweed, stands in the N. aisle, and here are the monuments to General Gordon and Lord Leighton; Rodney, Napier, Samuel Johnson are represented by monuments in the N. transept; Reynolds, Turner, Lawrence, Leighton, and Millais in Painters' Corner;

Until 1877 the cathedral was without a proper peal of bells. In that year the city companies subscribed to provide a peal of twelve, and these, inscribed with mottoes of the donors, are hung in the N.W. tower. A new bell, weighing 17 tons, was placed in the S.W. tower in 1882. The chapter house, which was also built by Wren, was converted into a bank in 1921.

In view of the nature of the subsoil, grave anxiety has been felt from time to time as to the safety of the fabric. Repairs in 1781 left something to be desired, and in 1914 an extensive scheme of restoration was begun, five years being spent on the virtual reconstruction of the S.W. pier of the dome, with 3,000 cu. ft. of new masonry.

During the Second Great War a German delayed-action bomb buried itself 27 ft. in the ground near the clock tower, Sept. 12, 1940. It

was conveyed by lorry to Hackney Marshes and Lt. Davies was awarded the G.M. for his work on this operation. A bomb went through the outer roof of the choir, destroying the high altar, Oct. 10, 1940, and the Chapter House (1712) was gutted by fire, Dec. 29, 1940. Further damage was inflicted by a bomb on the N. transept, April 16, 1941, which, piercing the saucer dome, exploded inside the cathedral. Many stained glass windows were shattered.

In the churchyard, which is converted into a public garden, and gives its name to the surrounding thoroughfares, are remains of the famous open-air pulpit known as Paul's Cross. A handsome memorial cross was erected here in 1910. See illus., p. 7242; Altar; Apse.

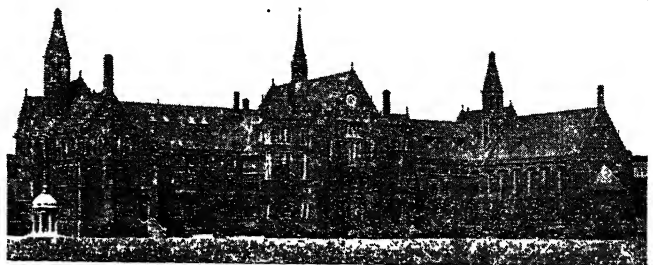
Bibliography. History, W. Dugdale, 1818; Annals, H. H. Milman, 1868; Chapters in the History of Old St. Paul's, W. S. Simpson, 1881; Old St. Paul's Cathedral, W. Benham, 1902; Memorials of St. Paul's Cathedral, W. M. Sinclair, 1909; St. Paul's Cathedral in Wartime, W. R. Matthews, 1946.

St. Paul's School. English public school. Founded by John Colet (*q.v.*), dean of S. Paul's, London, in 1509, it was early notable among the great schools of England by reason of Colet's devotion to the New Learning.



St. Paul's School arms

Its founder built the first school at the E. end of the old cathedral backing on to Old Change, and provided endowment for the free education in perpetuity of 153 scholars of all nations without distinction. There is a tradition that this number was fixed by that of the fishes taken in the miraculous draught. Clerical influence was kept at arm's length. William Lily, the grammarian, was the first high master and a layman; and as governors of the school Colet chose the



St. Paul's School, London. School buildings, from the playing field;

Mercers' Company. But S. Paul's was not divorced from religion, being dedicated to the Child Jesus and His Blessed Mother Mary.

The first building perished in the Great Fire. Its successor was in use from 1670 to about 1820, and the third and last building on the same site was occupied until 1884, when the school under a new scheme was removed to West Kensington. Here in buildings erected to the designs of A. Waterhouse it grew in numbers, and with F. W. Walker as high master gained a great reputation. Its history was written by M. F. J. McDonnell, 1909. Among the notable Old Paulines may be mentioned Milton, the 1st Duke of Marlborough, Pepys, Halley the astronomer, Boyce the composer, B. Jowett, Chesterton, Eric Kennington, and Lord Montgomery.

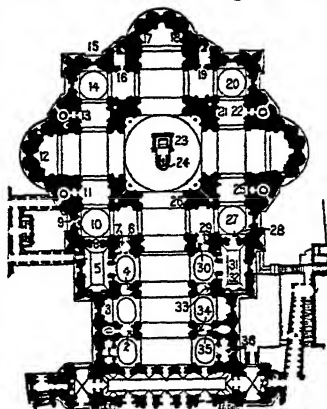
St. Peter. Lake of Canada, in Quebec. It is an expansion of the St. Lawrence river, 40 m. below Montreal. It is 30 m. long, 9 m. wide, and has an average depth of 8 ft. The shallowness of the lake prevented ocean steamers from reaching Montreal, and since 1850 a channel at least 300 ft. wide has been deepened at successive intervals in order to keep pace with the increase in size of merchant steamships.

St. Peter Port. Town of Guernsey, the capital of the island. It stands on the E. coast and has an extensive harbour, covering 73 acres, with floating dock, ship-building yards, etc. There are regular steamboat services to Southampton and Weymouth, and to other Channel islands. From the nearby airport services are operated to England and France. On the S. side of the harbour, on a rocky island, is Castle Cornet, an old fort, and S. of the town is Fort George. The chief buildings are S. Peter's church, dating from the 13th and 14th centuries, the court house, where the island legislature meets, and Elizabeth College, a public school. Hauteville House, later a museum, was the residence of Victor Hugo, 1855-70. Pop. est. 18,000. See Guernsey.

St. Peter's. Cathedral in Rome, the chief church of Roman Catholic Christendom, wherein the popes are crowned. A medieval cathedral formerly occupied the site of the present structure, but by the middle of the 15th century this had fallen into ruins. Nicholas V accordingly summoned Rossalini to design a new church. The architect had raised only a few feet of his building when his patron

died, 1455, and the scheme was abandoned. Julius II revived it.

Plans having been prepared by Donato Bramante, the foundation stone of the new building was laid



St. Peter's, Rome. Ground plan of the cathedral

1. Chapel of the font 2. Tomb of the Stuarts 3. Chapel of the Presentation 4. Innocent VIII 5. Choir chapel 6. Innocent XI 7. Leo XI 8. Pius VII 9. S. Gregory the Great 10. Clementine chapel 11. Door to the sacristy 12. Tomb of Palestrina 13. Monument to Alexander VII 14. Chapel of the Column 15. Altar of S. Leo the Great 16. Alexander VIII 17. Paul III 18. Urban VIII 19. Clement X 20. Chapel of S. Michael Archangel 21. Altar of Christ and S. Peter in the fishing boat 22. Monument to Clement XIII 23. High Altar 24. Statue of Pius VI 25. Benedict XIV 26. Statue of S. Peter 27. Gregorian chapel 28. Gregory XVI 29. Gregory XIII 30. Gregory XIV 31. Chapel of the Sacrament 32. Sixtus IV 33. Innocent XII 34. Monument to Maria Christina of Sweden 35. Monument to Leo XII 36. Pietà by Michelangelo. The tombs of the popes are indicated by their names

in 1506. Julius, however, died in 1513, his architect in the following year, and Raphael, who succeeded to the control of the works, lived only six years longer. The last was followed by Baldassare Peruzzi, Antonio Sangallo, Michelangelo, Della Porta, Domenico Fontana, and in the early 17th century by Carlo Maderna.

In the hands of these architects, both the plan and the details of the cathedral underwent much modification. Bramante had planned a Greek cross; Peruzzi's alterations were based on the plan of a Greek cross inscribed in a square; Sangallo, while retaining this form, modified the external design; Michelangelo completed the design for the dome and lantern so effectively that, though he did not live to see its completion, his work was faithfully carried out by Della Porta and Fontana. Maderna reconstructed the nave, and introduced a great deal of architectural detail that has been almost universally condemned. Finally, about

1660, Giovanni Bernini added the piazza with its colonnades.

The result of these changes, extending over 150 years, is not wholly satisfactory. The effect of the dome is obscured by Maderna's nave, while his façade with its heavy engaged columns is ponderous rather than dignified. The interior of the church holds some precious possessions, including a series of panels by Giotto (*q.v.*) and the paintings of angels by Melozzo da Forlì, a great bronze statue of S. Peter, dating probably from the 4th century, Bernini's famous baldachin (*q.v.*) of the high altar, and many religious relics. See Architecture; Colonnade; Renaissance.

St. Petersburg. Former name of Leningrad (*q.v.*).

St. Petersburg. City of Florida U.S.A. It is on the W. coast in Pinellas co., 20 m. S.W. of Tampa, and has a rly. terminus and air service. There are 33 m. of waterfront. The post office is built in the form of an arcade, its clerks dealing with crowds passing on the pavement. The commission-manager form of govt. was adopted in 1920. Only four or five days annually are without sun, and there are 150 hotels. Pop. est. 85,000.

St. Peter's College. Older name of Peterhouse (*q.v.*). (Cambridge)

St. Peter's Hall. College of Oxford university. Founded as a private hall in 1228 by Francis Chavasse, bishop of Liverpool, whose son Christopher Chavasse, later bishop of Rochester, became its first master, it was admitted to university status in 1947. It benefited from the generosity of Lord Nuffield, who doubled all contributions towards endowment up to £50,000. Membership is not confined to ordinands, though many students enter the ministry.

St. Pierre. French island near Newfoundland, forming part of the French colony of St. Pierre and Miquelon. St. Pierre with several adjacent islets has an area of 10 sq. m. and a pop. of 3,636. The town of St. Pierre is the capital of the colony and has cable connexions with the mainland. The colony owes its importance to the cod fishery on the Grand Banks; dried cod is the chief export. On Dec. 24, 1941, Adm. Muselier, commander of the Free French navy, landed on St. Pierre, and was welcomed by the inhabitants, who declared in favour of Free France. The governor, a Vichy partisan, was dismissed, and the wireless station closed. The U.S. govt. protested but no active measures were taken.

St. Pierre. Former capital of Martinique (*q.v.*). On May 8, 1902, the entire population, 30,000, except two, of this prosperous city was exterminated by an eruption of Mont Pelée. See Pelée.

Saint-Pierre JACQUES HENRI BERNARDIN DE (1737-1814). French author. Born at Havre, Jan. 19, 1737, and educated at Caen and Rouen, he became an engineer, and spent some time in rather aimless wandering about Europe. After three years in Mauritius he returned, in 1771, to France, where he became a friend of Rousseau, under whose influence he wrote *Études de la Nature*, and *Harmonies de la Nature*. His famous idyll, *Paul et Virginie* (*q.v.*), published in 1789, though over-sentimental for modern taste, still retains some of its charm. He died Jan. 21, 1814.



B. de Saint-Pierre,
French author

St. Piran-in-the-Sands. Ancient church building, 1½ m. N. by E. of Perranporth, Cornwall. It dates from the 6th or 7th century, and is on a site alleged to be that of a monastic cell built by S. Piran, an early Irish Christian missionary who arrived in Cornwall c. 460. See Perranporth.

St. Pol-de-Léon. Town of France. In the dept. of Finistère, it lies 13 m. N.N.W. of Morlaix,

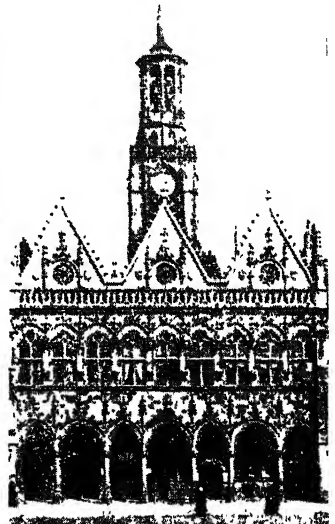
and ½ m. from the English Channel, where there is a small harbour, Pempoul. The 13th-15th century cathedral, restored in 1866, is dedicated to S. Pol, who founded a monastery here in the 6th century. The bishopric was suppressed in 1790.

St. Quentin. Town of France, in the dept. of Aisne. It is on the Somme on the St. Quentin canal, 95 m. N.E. of Paris. Originally a Roman settlement, Augusta Viro-manduorum, it was renamed in honour of the martyr S. Quintinus, who was buried there. The town was the capital of the Vermandois fief before coming under the direct rule of the French monarchy in 1213. In 1557 Philibert of Savoy and in 1871 the Prussians defeated French armies here. During the First Great War the town was in the fighting line for long periods and was almost destroyed; the Gothic town hall (14th-15th century) was a notable loss, but was rebuilt after the war. Its industry was mainly concerned with textiles. In the Second Great War it again suffered, being captured May 19, 1940, by the Germans, after much confused fighting between armoured columns. After the fall of France it came within the German-occupied zone. St. Quentin was abandoned by the Germans in Aug., 1944, when the British 2nd army made a swift advance from the Seine to the Somme. Pop. 48,556.



St. Quentin arms

St. Raphael. Fishing town of France, in the dept. of Var. It is on the Mediterranean, 2 m. S.E. of Fréjus. Napoleon landed here on his return from Egypt in 1799, and embarked from here for Elba in 1814. The buildings include an



St. Quentin, France. The town hall, built to replace the 14-15th cent. hall destroyed in the First Great War

old church, once fortified, and the modern one of Notre Dame de la Victoire. There are relics of a Roman aqueduct. From here starts the Corniche d'Or, a fine coast road to La Napoule, completed in 1903. The town is a sea-bathing and winter resort.

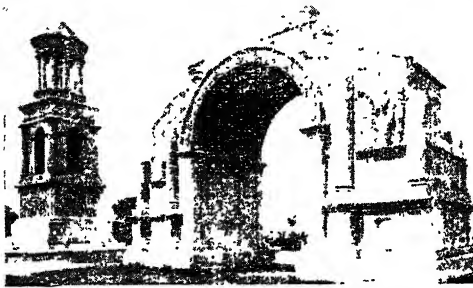
St. Rémy, OR ST. RÉMY-DE-PROVENCE. A town of France. In the dept. of Bouches-du-Rhône, it is situated on the Alpines or Alpilles, a range of hills between the Rhône and the Durance, 9½ m. E. of Tarascon. It is noted for its Roman remains, which include a triumphal arch supposed to have belonged to the Roman town Glanum Livii, destroyed by the Visigoths in 480. There is also a well-preserved mausoleum, known as the Tomb of the Julii, and dating from the early part of the 1st century. It is 60 ft. in height, and is built in three storeys, the lowest being decorated with reliefs. St Rémy is the birthplace of the Provençal poet Roumanille (1818-91), and Nostradamus (1503-66), the fortune-teller and astrologer. Near the town is the ancient priory of St. Paul-de-Mausole, which has a Romanesque church. There are two places of this name in the Puy-de-Dôme.

St. Rollox. Dist. of N.E. Glasgow, Scotland. It has a rly. station and a basin on the canal. The chief industries are chemical works and machine shops.

St. Ronan's Well. Eighteenth of the Waverley novels by Scott published 1823. A contemporary



St. Pol-de-Léon, France. The cathedral of S. Pol, from the north-west



St. Rémy, France. Roman mausoleum and triumphal arch. See facing page

study of society at a Scottish spa, with a tragedy underlying the petty jealousies and quarrels of the habitués, the scenes are generally placed at Innerleithen and Peebles. The story, which was altered (and weakened) at the request of James Ballantyne, contains in Meg Dods and the Rev. Josiah Cargill two of the most successful of Scott's characters. See Dods, Meg.

Saints, BATTLE OF THE. Fought between the British and the French, April 12, 1782. It takes its name from the islands of Les Saintes, which lie in the channel that separates Dominica from Guadeloupe in the Leeward Islands. Rodney had come from home with 14 sail of the line, and having taken Hood's squadron under his command, was at Santa Lucia watching the French.

On the night of April 8, De Grasse, in command of the French fleet, lost an opportunity of falling upon Hood, while the remainder of Rodney's fleet was yet almost becalmed behind the island, but he was too much concerned for his convoy, which, by the evening of the 9th, had got clear of the shadow of Dominica. The convoy was sent ahead to Guadeloupe, and up to the evening of April 11 De Grasse succeeded in avoiding battle.

Rodney, however, sending the quickest ships ahead, fell upon the sternmost ships of the French line, and De Grasse was thus compelled to bring back his fleet to rescue the menaced vessels. The attack was made on the lee side, and each ship bore up as she approached, until the lines became approximately parallel on opposite tacks. The French line, heavily damaged by fire, was very ragged, and a great gap opened between the 17th and 18th ships. Through this gap passed Rodney in the Formidable. Thus De Grasse's fleet was broken up, his ships were overwhelmed, and several of them captured.

Saint-Saëns, CHARLES CAMILLE (1835-1921). French composer.

every branch of music, but the creative impulse was often lacking, so that comparatively few works are still played. These include the majestic opera Samson and Delilah, 1877 (Covent Garden, 1909); symphonic poem, Le Rouet d'Omphale, 1871; Le Carnaval des Animaux, which contains a beautiful melody, The Swan; Danse Macabre; second piano concerto in G minor; and third symphony in C minor. Saint-Saëns published volumes of criticism, essays, and poems. He died in Algiers, Dec. 16, 1921. A full biography by J. Bonnerot appeared in 1923.

St. Sampson. Town and parish of Guernsey, Channel Islands. It is on the E. coast, 2½ m. N. of St. Peter Port. It has a tidal harbour, sheltered by a breakwater 650 ft. long, a 12th century church, and an extensive trade in stone procured from the neighbouring quarries.

Saintsbury, GEORGE EDWARD BATEMAN (1845-1933). British scholar and critic. He was born at Southampton,



George Saintsbury, British scholar Russell

Oct. 23, 1845, and educated at King's College School and Merton College, Oxford. After eight years as a schoolmaster, and 20 as a journalist, when he was connected with the Saturday Review, he was professor of rhetoric and English literature at Edinburgh, 1895-1915. He died at Bath, Jan. 28, 1933.

Saintsbury is famous for the long series of critical works in which he displayed an encyclope-

Born in Paris, Oct. 9, 1835, he studied under Benoist and Halévy at the conservatoire, was organist of St. Merri, 1853-58, and of the Madeleine until 1877. A great pianist, he performed in many countries, including the U.S.A., 1906, and S. America, 1916. A master of technique, he touched nearly



C. C. Saint-Saëns, French composer

died knowledge of English and French literature. The expression of a forceful but charming personality sometimes overcame true impartiality. He contributed 21 chapters to the Cambridge History of English Literature; and wrote Dryden (English Men of Letters), 1881; Short History of French Literature, 1882; Essays in English Literature, 1890; History of Criticism, 3 vols., 1900-04; A History of English Prosody, 3 vols., 1906-10; The English Novel, 1913; A History of the French Novel, 2 vols., 1917-19; Notes on a Cellar Book, 1920; Scrap Books, 1922-24. Consult G.S., the Memorial Volume, ed. J. Oliver, A. M. Clark, and A. Muir, 1945.

St. Servan. Town of France. In the dept. of Ille-et-Vilaine, it stands at the mouth of the Rance, about 1 m. S.W. of St. Malo. It is defended by a fort known as the "Cité." The Tour de Solidor dates from the 14th century, the church of S. Croix is modern, and there is a modern town hall. The industries include cod-fishing, boat-building, net-making, and tanning. It was here that Chram was burnt to death by order of his father, Clotaire I, in 558. Pop. 12,832.

Saint's Everlasting Rest, THE. Religious work by Richard Baxter. First published in 1650, it was described on its title page as "Written by the author for his own use in time of his languishing, when God took him off from his public employment." Remarkable for its clear and admirable literary style, the book is a masterpiece of English devotional literature.

Saint-Simon, CLAUDE HENRI, COMTE DE (1760-1825). French economist. Born in Paris, Oct. 17, 1760, he fought as a volunteer against the British in the American War of Independence. Imprisoned as an aristocrat during the French Revolution, he yet sympathized with its principles, but suffered from disillusionment as he gradually realized the incapacity of the mob for government. Extravagant habits having reduced Saint-Simon to poverty, he began to write, but for the remainder of his life he was mainly dependent on the charity of relatives. He died on May 19, 1825.



Comte de Saint-Simon, French economist

Saint-Simon's socialist theories are expounded chiefly in *The Industrial System*, 1821. The corner stone of the socialist community, as outlined by him, was to be an aristocracy of intellect, a body of experts conducting the business of society in the most scientific way. His doctrines enjoyed a wide vogue, among his notable disciples being Comte, the philosopher, Lesseps, the engineer, Carnot, "the organizer of victory," Thierry, the historian, Enfantin, and Bazard, the two last being the most enthusiastic. Saint-Simon's later works include *Industrial Catechism*, 1823, and *New Christianity*, 1825. *Consult Saint-Simon and Saint-Simonism*, A. J. Booth, 1871; *Histoire de Saint-Simonisme*, S. Charléty, 1896.

Saint-Simon, LOUIS DE ROUVROUX, DUC DE (1675-1755). French memoir writer. He was born at



Duc de Saint-Simon,
French writer

Versailles, Jan. 16, 1675, and joined the royal corps of the Grey Musketeers. He fought at Namur, 1692, and Neerwinden, 1694, and succeeded to the dukedom at the age of eighteen. Two years later he married Gabriel de Durfort. Saint-Simon was appointed ambassador to Rome in 1705, but the appointment was almost immediately cancelled. On the death of Louis XIV he became a member of the council of regency. In 1721 he went to Spain to arrange the marriage of Louis XV with the Infanta, and shortly after his return, 1723, retired to La Ferté-Vidame, where he devoted himself to the writing of his memoirs. He had been a tireless collector of material of all kinds, from documents of the greatest importance to gossip of the slightest. He died in Paris, March 2, 1755.

Portions of Saint-Simon's *Memoirs* were published from time to time surreptitiously, but it was not until 1839 that they were issued in full. He was a keen observer and a true artist, and his memoirs take high rank among works of their kind, being unmatched for their pen-portraits of people whom the writer had met, and invaluable for the light they throw on the life of his period. The best complete editions are those edited by P. A. Chéruel, 21 vols., 1873-86, and by A. de Boislisle, in the *Grands*

Écrivains de la France series, 16 vols., 1879-1904. There is an abridged translation in English, by B. St. John, 1857, new ed. 1901. *Consult Saint-Simon*, C. W. Collins, 1880; *Causeries de lundi*, C. A. Sainte-Beuve, Eng. trans. E. J. Trenchmann, 1909-11.

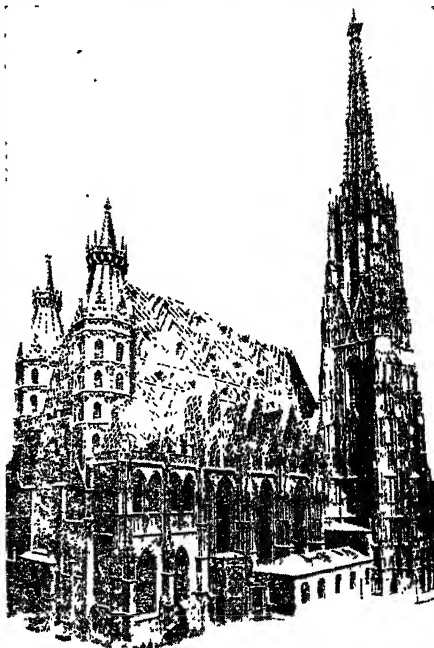
St. Sophia. Mosque in Istanbul. It was originally a Christian church, of which the foundation stone was laid by the Emperor Justinian, Feb. 23, 532, the architects being Isidorus of Miletus and Anthemius of Tralles. The church was completed within six years, and on Dec. 26, 537, was formally dedicated to Hagia Sophia (Holy Wisdom). In ground-plan the church is nearly square, the measurements, excluding the apse and narthex, being 250 ft. by 237 ft. The main building is reached through an outer and an inner narthex. A great central door, or royal gate, leads into an oval-shaped nave of which the centre consists of a square (107 ft. sides) bounded by massive piers, of which the semi-circular arches support a great dome. On either side of the nave is an aisle in two storeys, and the semi-circular ends of the nave are crowned by semi-domes linked up with the main dome. The walls are of brick, lined with precious marbles, and the columns are of porphyry and verd antique.

The church became a Mahomedan mosque in 1453, but beyond a number of minarets and other adjuncts, added by the Turks to its exterior, little alteration was made, and it remains a perfect specimen of the old Byzantine craftsmanship. The Turks, however, have plastered up some of the original decoration of the interior, and Mahomedan pulpits, platforms, and inscriptions have largely ousted the Christian counterparts, though Christian emblems are still to be found among the splendid mosaics. *See Istanbul*; *Pulpit*.

St. Stephen's. Name given to the palace of Westminster, the meeting place of the British houses of parliament. St. Stephen's hall

occupies the site of St. Stephen's chapel, founded 1380, and was long used for meetings of the commons. St. Stephen's court and St. Stephen's porch adjoin it; below is St. Stephen's crypt. St. Stephen's cloisters, on the E. side of Westminster hall, were built by Henry VIII. *See Parliament*. Houses of.

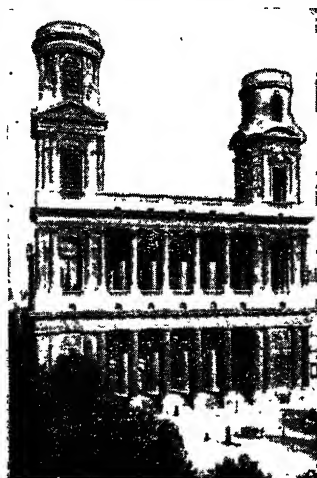
St. Stephen's. Cathedral church in Vienna. It stands in the centre of the inner city, and dates chiefly from the 14th and 15th centuries, but incorporates fragments of the original 12th century building (destroyed by fire 1193). Notable features were the celebrated tower and spire, 450 ft. high, rebuilt 1860-64; high-pitched roof, tomb of Frederick III, 12th century wooden crucifix pulpit by Anton Pilgrim, Baroque



St. Stephen's, Vienna. This beautiful Gothic cathedral as it appeared before being damaged in the Second Great War

organ, 35 marble altars, and late Gothic choir stalls. One of the finest Gothic churches in Europe, it was badly damaged by fire during the Second Great War; the roof was completely destroyed, together with the vaults over the choir, choir stalls, and organ.

Saint Sulpice. Church in Paris. It is situated in the *rue* and *place* of the same name, on the left bank of the Seine, on the site of a 12th century church, and was built during 1646-1733. Five flights of steps lead to the entrance, and the



St. Sulpice. Façade of the Paris church, composed of Doric and Ionic colonnades

façade consists of two colonnades, Doric and Ionic, one above the other. The spacious interior is notable for its spherical vaulting, Corinthian pillars, frescoes, paintings and sculptures. There are 18 chapels. In the *place* is a fountain, 1847, ornamented with statues of Bossuet, Fénelon, Massillon, and Fléchier. The Séminaire de Saint Sulpice, near by, was founded in 1646 and closed in 1906.

St. Swithin's Day. Name given to July 13. For the origin of the legend about rain on this day see under Swithin.

St. Thomas. One of the Virgin Isles, W. Indies, belonging to the U.S.A. It is situated about 38 m. E. of Puerto Rico, is 14 m. long, and has an area of 32 sq. m. The surface is hilly, rising to 1,560 ft. in the centre of the island. It has a warm, temperate climate. It was discovered by Columbus on his 2nd voyage, 1493, but was occupied by the Danish W. India Co. from 1672. During the Napoleonic wars it was twice occupied by the British, and was purchased from Denmark by the U.S.A. in 1916. The harbour of Charlotte Amalie, the capital is valuable as a naval base. The population, mostly descended from negro slaves, was 11,265 in 1940, over 60 p.c. being negro.

St. Thomas or **SAN THOMÉ.** Volcanic island in the Gulf of Biafra. It is 170 m. W. of the mouth of the river Gabun and 100 m. S.W. of the island of Principe.

A Portuguese possession, with the island of Principe (*q.v.*), it constitutes a province under a governor. The vegetation is rich and varied but the climate is unhealthy. The chief products are cocoa, coffee, palm oil, and rubber. There is a rly. to the village of Trinidad, but communications within the island are bad, except around the capital, San Thomé, on the N.W. coast. Area, with Principe, 372 sq. m. Joint pop. 60,490.

St. Thomas. City of Ontario, Canada, the capital of Elgin co. It stands on Kettle Creek, a few miles from Lake Erie, 157 m. S.W. of Toronto, and is served by the C.N.R., the C.P.R., Michigan Central, Père Marquette, and Wabash lines. The industries include rly. shops, flour mills, and the making of clothing, agricultural implements, etc.; and the city is a market for the fruit and other produce of the vicinity. Pop. 17,132.

St. Thomas Mount. Suburb of Madras, India, in the Chingleput dist. It is situated 8 m. S. of Madras city by the Buckingham Canal. The cross of S. Thomas, the apostle, is supposed to have been found on the top of a hill of 200 ft., on the slope of which tradition says the saint was slain in A.D. 68 by Brahmins; a Portuguese church built in 1547, marks the spot. Pop. 19,500.

St. Thomas's Hospital. Ancient medical institution in London, on the Albert Embankment, adjoining Westminster Bridge. It

Akenside (*q.v.*), author of *The Pleasures of the Imagination*, and Sir G. H. Makins. The school of anatomy at St. Thomas's is the oldest in London. The hospital, during the Second Great War, was hit twelve times by bombs, and was extensively reconstructed afterwards. See London. Consult *The Story of St. Thomas's*, 1106-1947, C. Graves, 1947.

St. Trond (Flem. *S. Truiden*). Town of Belgium, in the prov. of Limburg. It lies in undulating country, 11 m. by rly. S.W. of Hasselt, and is a junction on the Hasselt-Landen line. There are industries in tanning, tile-making, tobacco, and brewing, and local agricultural trade. The church of Notre Dame dates from the 14th century, with modern tower and front. The seminary church has a tower which was part of the abbey of S. Trudo, founded in 657, and the 18th century church of the Franciscans is notable. Pop. est. 16,000.

St. Valentine's Day. Feast of S. Valentine (Valentinus), an Italian saint, celebrated Feb. 14. The feast has been regarded since the Middle Ages as a lovers' festival. Chaucer in his *Parlement of Foules* says that every bird chooses his mate on S. Valentine's Day. A friend or sweetheart chosen on that day was a "valentine" for the rest of the year; in some parts of the country the first person of the other sex met on Feb. 14 is a "valentine." The giving of pre-



St. Thomas's Hospital, London. Post-war view of the buildings on the Thames embankment, Westminster Bridge in foreground

was founded in the reign of William II out of the proceeds of a ferry over the Thames near London Bridge. Destroyed by fire in 1207, and rebuilt in 1228, the hospital was endowed and incorporated by Edward VI in 1553. The present building was opened by Queen Victoria in 1871. Before the Second Great War (in which the hospital was heavily damaged) it contained over 1,000 beds, and had a large and excellent medical school. Among distinguished men who have been on the staff of St. Thomas's are W. Cheselden, Sir John Simon, Dr. Charles Murchison, Sir William McCormack, Mark

sents at this festival deteriorated into the sending of cards and other missives, some with messages of the amorous sort, and some merely comic or satiric. The custom survived in country places to the end of the 19th century, but, despite attempts to revive it, almost died out early in the 20th century.

St. Valéry-en-Caux. Coastal town of France, in the dept. of Seine Inférieure. It is situated 20 m. W. of Dieppe, and came into prominence during the Second Great War. During the British retreat of June, 1940, the 152nd and 153rd bdes. of the 51st (Highland) div. reached their final posi-

tions around the town on June 10. A bridgehead was formed round the port, the southern sector being held by units of the French 9th Corps. On June 11 the bridgehead was heavily shelled and bombed by the Germans; and that night a withdrawal to the beaches was ordered. At the same time and unknown to the force at St. Valéry, British troops were being embarked at Veules-les-Roses, only 1½ m. away. The plan for embarking at St. Valéry miscarried, because the Germans forced back the French and took the British positions in the rear, occupying the harbour and beaches. About 200 officers and 5,000 men of the B.E.F. were captured. On Sept. 2, 1944, the 51st (Highland) Division liberated St. Valéry, under command of Maj.-Gen. Rennie, who, captured there in 1940, had escaped ten days later. On June 11, 1950, a memorial to the 51st div. was dedicated here, and the town received the Croix de Guerre.

St. Vincent. Second in size of the British Windward Islands, West Indies. It lies 21 m. S. of St. Lucia. Of oval shape, it is crossed N. to S. by a mountainous ridge near the N. end of which is the Soufrière, an active volcano about 4,000 ft. high. The fertile valleys yield sugar, arrowroot, cacao, spices, molasses, copra, cassava, peanuts, and Sea Island cotton. The administrator is assisted by a legislative council, consisting of three ex-officio members, three nominated members, and five elected members. Columbus discovered the island in 1498; in 1797, subsequent to a rebellion, the majority of the native Caribs were transported to Ruatan in British Honduras. In 1902 the Soufrière erupted, simultaneously with Mont Pelée, and a third of the island was devastated. Kingstown is the capital. Area 150 sq. m. Pop. 61,593.



St. Vincent arms

St. Vincent, CAPE. Promontory forming the S.W. corner of Portugal. The ancient Promontorium Sacrum, or sacred point, it is famed for several naval battles fought in its vicinity. The first of importance was on June 16, 1693, when the British fleet under Rooke was defeated by the French under Tourville. On Jan. 16, 1780, Rodney defeated the Spanish under Langara. On Feb. 14, 1797,

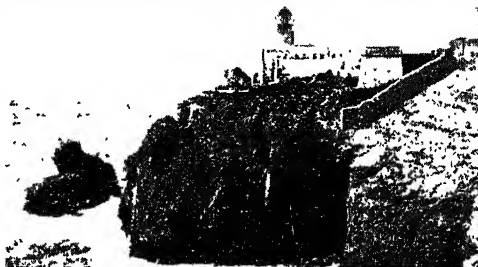
was fought the great battle when the British under Jervis overwhelmed the Spanish fleet. The last was the victory gained, July 5, 1833, by Sir Charles Napier over Dom Miguel's fleet. There is a lighthouse on the cape, and near by is Sagres.

St. Vincent, BATTLE OF. Fought off Cape St. Vincent, 1797, between the British and the Spaniards.

On Feb. 14 the Spanish fleet, which had left Cartagena for Cadiz, its object being to join the French at Brest and cover the passage of the army of invasion, fell in with Jervis off Cape St. Vincent. The military and political situation was exceedingly critical for the British, to whom a victory was essential. Jervis with 15 sail determined to attack the 27 of the Spaniards. The fleets approached on opposite tacks, Jervis in the Victory, with a close well-ordered line, and the Spaniards in a loose formation of two groups. Jervis decided to steer for the wide gap between the groups, calculating that he would be able to tack and engage the Spanish weather group, while the ships to leeward would not be able to come to their assistance. Contrary to his expectations the Spanish lee division did make an unsuccessful attempt to break the British line.

Nelson, who was in the rear, saw also that the leading ships of the Spanish weather line would endeavour to work round Jervis's rear and join their discomfited lee division. Taking, therefore, one of the great decisions of his life, and in splendid disobedience, he wore his ship, the Captain, round, and came athwart the Spanish weather line, which was already bearing up to leeward. His ship was heavily pressed, but was relieved by the Culloden and Blenheim and other ships under Jervis's orders. There was a tremendous conflict, in the course of which Nelson boarded the San Josef and San Nicolas in brilliant fashion. Two other Spanish ships were also taken.

St. Vincent was a famous victory, but the Spanish squadron, shorn of its four ships, returned to Cadiz. Jervis well deserved the earldom he won, though he did not follow up the attack when com-



Cape St. Vincent, Portugal. Lighthouse on the extremity of the cape

plete victory lay before him, and the battle stands as a triumph for Nelson, whose disobedience was condoned by his commander-in-chief, and the battle broke up all the French plans for the invasion of England.

St. Vincent, GULF OF. Indentation of the S. coast of Australia, in S. Australia. It is separated from Spencer Gulf by Yorke Peninsula; off the mouth lies Kangaroo Island. It is 90 m. long and 40 m. wide, and is a submerged portion of the S. Australian rift valley; its shores are low and sandy. Adelaide is on the E. shore.

St. Vincent, JOHN JERVIS, EARL (1735-1823). British sailor. Born Jan. 9, 1735, he went to sea at the age of fourteen, and was promoted lieutenant in 1755. Commander in the fleet which took Wolfe to Quebec, 1759, he served in N. America, the North Sea, West Indies, and the Mediterranean. In 1775 he was appointed to command the Foudroyant, in which he had several actions with the French, took part in the relief of Gibraltar, and in the battle off Cape Spartel, 1782. Promoted rear-admiral in 1787, and vice-admiral in 1793, he sailed to the West Indies the following year, capturing Martinique and Guadeloupe.



Earl St. Vincent, British sailor

In 1795 he was appointed commander-in-chief in the Mediterranean. The combination of the French and Spanish navies forced Jervis to make the Tagus, whence he sailed to attack the Spanish off Cape St. Vincent, and effected a brilliant victory. For this he was made an earl. In command of the Channel fleet, 1799-1801, when he became first lord of the Admiralty, he introduced many reforms and

incurred much enmity before his retirement from office in 1804. After a brief period in command of the fleet, 1806-07, he retired, dying March 14, 1823. St. Vincent introduced a stern discipline which bordered on the brutal, and was intensely disliked by all ranks in the navy. This iron discipline was amply justified, however, by the remarkable state of efficiency the navy reached under his command. *Consult* Life, O. H. Sherrard, 1933.

St. Vitus's Dance. Popular name for chorea (*q.v.*). Sufferers from epidemic dancing mania, which combined physical and mental excitement, in medieval Germany resorted to the shrines of S. Vitus, who was reputed to have the power of cure. His name transferred itself to the disease.

St. Winefride's Well. Sacred spring at Holywell (*q.v.*), Flintshire, Wales. It was named after the 7th cent. saint, S. Winefride, and is said to have arisen at the spot where her head fell when she was beheaded by Caradoc, prince of Wales. Famous as a place of pilgrimage and for the healing qualities of its waters, it was leased by the urban council to the R.C. Church for £125 a year. After flooding the pilgrims' bath, the water, which at one time issued at the rate of 120 tons a minute and flowed on to serve as an adjunct to the industries in the adjacent valley, ran dry in 1917, as a result, it is thought, of local draining operations carried on in connexion with lead-mining.

Sais. Ancient city on the Rosetta arm of the Nile, near Sa el-hagar, Lower Egypt. The residence of the predynastic northern kings and the centre of Neith worship, it subsequently provided the Saitic kings of the XXVIth dynasty, 663-525 B.C., and became a royal capital of much opulence and learning. *See* Egypt.

Saivas or **SIVAITES.** General name for worshippers of the Hindu deity Siva (*q.v.*), notable for extremes of asceticism and psychic philosophy.

Sajo. River of N. Hungary and Czecho-Slovakia. It rises E. of the High Tatra in the Carpathians, and flows in general S.E. for 100 m. to join the Theiss (Tisza). Miskolcz is the chief town on its bank and the Hernád the largest tributary.

Sakai (Malay, servant) Primitive people in the Malay peninsula, mostly in S.E. Perak and N.W. Pahang. Brown, wavy-haired, medium-headed, and averaging 4 ft. 11½ ins. in height, they live on jungle fruits and game hunted with

6-8 ft. bamboo blowpipes; some carry on simple agriculture with digging-sticks. They practise scar-tattooing and body-painting, wear bark-cloth or leaf girdles, and inhabit tree-huts or leaf-shelters.

Sakai. Seaport of Honshu, Japan. It stands on the Inland Sea, in Osaka prefecture, 6 m. S. of Osaka. Iron, cotton goods, bricks, and cutlery are made, and fishing is an occupation. Pop. 72,800.

Sakalava. A negroid people occupying the W. slope of Madagascar. Numbering some 150,000, a tall, dark, frizzy-haired, thick-lipped, long-headed race, they comprise a medley of tribes who c. 1650 came under the dominion of warlike Indonesian immigrants, until these were in their turn subdued by the Hova during the 19th century. Their small, oblong huts, bark-clothing, and animism are Oceanic or W. African, rather than Bantu; they are being increasingly influenced by the Hova culture. *See* Madagascar.

Sakaria. River of Asiatic Turkey, anciently known as the Sangarius. It rises in the ranges E. of Kutaya, and has an extraordinary course, flowing first E., then N., next W., and finally N. It enters the Black Sea about 90 m. E. of Istanbul. On its banks a battle was fought between the Greeks and Turks in Aug.-Sept., 1921. In command of the Turks, Mustapha Kemal had established a fortified zone extending in a wide semi-circle for a distance of 60 m., and 14 m. in depth, on the rocky mt. slopes and summits covering the river. From Aug. 23 to Sept. 5 the Greeks attacked, gaining several successes, but no reinforcements came up, their communications were cut several times, and their ammunition and stores were running out. On Sept. 11-12 the bulk of the Greek army retired without molestation, the victory in effect going to the Turks. Greek casualties were put at upwards of 30,000; those of the Turks were probably as numerous.

Sakchi. Alternative name of Jamshepur (*q.v.*), in Bihar, India.

Saké. Japanese national beverage. A kind of beer, made chiefly from rice, it is an alcoholic, fermented beverage obtained by a complicated process in which bacteria obtained from *Aspergillus oryzae* play an important part. The first fermentation lasts for about a month, the second for a little over a week. Light in colour and unpleasing to the European palate, saké is quickly productive of intoxication.

Sakhalin or **SAGHALIEN.** Island of E. Asia, about 600 m. long by from 15 to 100 m. broad, and with an area of c. 25,000 sq. m., it is situated on the W. side of the sea of Okhotsk, and is separated from the Siberian mainland by the narrow strait called the gulf of Tartary. Its long mountainous backbone rises above 5,000 ft. in the S.E. and in the N.

With summer temps. similar to those of the U.K., it has an average of 33° of frost in Jan. at Alexandrovsk. Larch, fir, spruce, and birch occur in the extensive forests. There are herring and salmon fisheries, the natives, Gilyaks in the N., and Ainus, depending for food almost entirely on fish. Petroleum occurs, and coal is mined. A rly. connects Cape Pogobi with Dué and Alexandrovsk. Until the 20th century the province was reserved as a penal colony. The first convicts were sent in 1869, and all women condemned to hard labour were sent there from European Russia.

Russians first settled in Sakhalin in 1857. The S. part, called by the Japanese Karafuto, belonged to Japan until ceded to Russia in 1875 in exchange for some of the Kurile Is. That part of Sakhalin S. of lat. 50° N. was ceded back to Japan under the treaty of Portsmouth (*q.v.*), 1905, and was annexed by Russia in 1945 in accordance with a secret Allied agreement made at the Yalta Conference (*q.v.*). *See also* Ainu; Gilyak.

Saki (*Pithecia*). Group of American monkeys with long non-prehensile tails. The body is



Saki monkey of the forests of Guiana and the Amazon valley

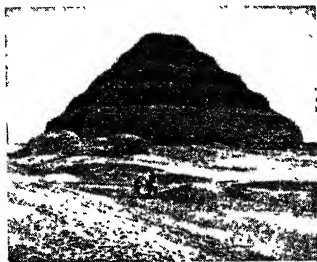
usually covered with long dark hair, and the face is yellow or whitish. Occurring only in Guiana and the valley of the Amazon, little is known of their habits, as they never live long in captivity.

Saki. Pen-name of Hector Hugh Munro (*q.v.*), British author.

Sakjegeuzi. Village in a valley-plain between the Ghaour-Dagh and the Qurt-Dagh, Asiatic Turkey. It marks the site of a prehistoric settlement. Upon this arose a post-Hittite fortified city, dating between 1100 and 850 B.C., with

a palace and temple, sculptured lions and sphinxes, and reliefs.

Sakkara. Village near the left Nile bank midway between Gizeh and Dahshur, in Egypt. The pla-



Sakkara, Egypt. The IIIrd dynasty step pyramid of Tchecer

teau westward was used under the Old Kingdom as a necropolis presided over by Sokar, "the confined one." Of its 20 pyramids, mostly in ruins, the IIIrd dynasty "step-pyramid" of Tchecer is a transitional mastaba (*q.v.*). The VIth dynasty pyramid of Unas contains a basalt sarcophagus. The Vth and VIth dynasty tombs are many-chambered structures with exquisite mural reliefs. The oldest dated papyrus (VIth dynasty) was found there, 1893. Quibell (1911-12) cleared 400 mastaba tombs of the IIInd and IIIrd dynasties, and an early Coptic monastery. *See* Apis; Serapeum.

Saklatvala, SHAPURJI (1874-1936). British politician. Son of a Parsee merchant, he was born at Bombay, March 28, 1874, and educated at S. Xavier's school and college there. He joined his mother's family business of Tata and Sons, and, in conjunction with his cousin, Sir Sorabji Tata, he spent three years in the jungle prospecting for metal, the result being the foundation of the Tata iron and steel works in Bihar and Orissa. Saklatvala came to England in 1905 and joined the I.L.P. in 1910, but later broke with them, becoming a member of the Communist party and being M.P. for Battersea, 1922-23 and 1924-29, the first Communist elected to the house of commons. He was a popular speaker, and suffered imprisonment for subversive speeches and activities. He died Jan. 16, 1936.

Saktas (Skt. *sakti*, power). Hindu sect. Its members are votaries of the female principle of divine energy or self-created wife of Siva. *See* Siva; Tantras; Vishnu.

Sakurajima. Island of Honshu, Japan. It is situated in the upper part of Kagoshima Bay, and was

famous for the growing of the daikon, a giant radish. The island measures 6½ m. by 5 m. There are mineral springs and an active volcano, 3,745 ft. high.

Sal (*Shorea robusta*). Timber tree of the family Dipterocarpaceae. A native of the Indian subcontinent, it attains a height of about 100 ft., has alternate oval leaves and clusters of sweet-smelling yellow flowers. The resin from the trunk yields dammar, and the tough close-grained wood, stronger and heavier than teak, is extensively used in shipbuilding.



Sal. Flower cluster and leaves; inset, flower

Sala, GEORGE AUGUSTUS HENRY (1828-95). British journalist.

Born Nov. 24, 1828, in London, where, and in Paris, he had a desultory education, he became a clerk, then a theatrical scene painter and book illustrator. In 1848 he edited *Chat*; he wrote *Household Words*, 1851-56; and in 1857 began his long connexion with the *Daily Telegraph*, for which he acted as special correspondent with the North during the American Civil War, 1861-66; with the French, in the Franco-Prussian War, 1870-71; in Russia, 1876; in Australia, 1885; and elsewhere.

He contributed *Echoes of the Week* to the *Illustrated London News*, 1860-86; founded and edited *Temple Bar*, 1860-66; contributed a series of papers on Hogarth to the *Cornhill Magazine*, 1860, which were afterwards published in book form; was a regular contributor to the *Sunday Times*, 1886-94; and edited *Sala's Journal*, 1892-94. His numerous and varied works include *Twice Round the Clock*, 1859, a series of sketches

of London life; *Paris Herself Again*, 1879; several novels, among them *Captain Dangerous*, 1863, and *Quite Alone*, 1864; travel books; *Things I Have Seen*, 1894; *Life and Adventures*, 1895; and *The Thorough Good Cook*, 1895. He died at Brighton, Dec. 8, 1895. *Consult* Life, R. Straus, 1942.

Salaam (Arab. *salām*, peace). Oriental salutation. Strictly the salaam is the verbal salutation between Mahomedans, but the word is applied in the East to any salutation, especially to a ceremonious obeisance, such as that performed in India by bending low the head and body, and placing the palm of the right hand on the forehead. The term has also been used in the sense of compliments or greetings, and the popular phrase, "So long!" in the sense of good-bye is believed to be a corruption of it. A Jewish salutation is Shalom.

Salad (late Lat. *salata*, salted). Mixture of vegetables and other ingredients eaten cold. It is made generally of uncooked material, though cooked vegetables are sometimes used. Lobster, salmon, chicken, or meat salad is made of the uncooked vegetables mixed with the special substance cut small. Fruit salad consists of various fruits cut in pieces, and covered with a syrup of sugar boiled in water.

Salad (Span. *celadn*, from Lat. *caelare*, to engrave). Light helmet. Introduced in the 15th century, its characteristic features were the neck guard, and the smooth, globular form. In place of a vizor, the solid front of the piece was pierced with a slit for the eyes. Alternate names were Sollet and Salet. *See* Helmet.

Saladin (Ar. *Salah-ud-din*, honouring the faith). Sultan of Syria and Egypt. Son of a Kurdish general, he spent his youth in Damascus, of which city his father was governor. In 1164 he accompanied his father on a campaign against Egypt, whose friendship to the Franks was a source of danger to the Muslim powers. For five years he fought the Christians who came to the aid of Egypt, and by 1170 he had become vizier. On the death, in 1174, of his master, Nur-ed-din, sultan of Syria, Saladin hastened north, and by the following year had made himself master of the realm, and been declared sultan.

The next few years were spent in extending his territory, and in strengthening his hand for the inevitable struggle with the Christians, which he opened in 1187 by a



G. A. Sala, British journalist

brilliant sweep through Palestine, culminating in the capture of Jerusalem, Oct. 2, 1187. Only Tyre remained in Christian hands, but thence they marched on Acre. Hastening thither, Saladin surrounded the Christian host, but the latter was reinforced by sea, and the arrival of Richard Coeur de Lion, 1191, followed by the fall of Acre, checked the victorious paynim. Next year, however, he forced the Christians into the unsatisfactory peace, which closed the Third Crusade, Sept. 2, 1192. Six months later Saladin died at Damascus, March 4, 1193. Devout, enduring, kindly, honourable, and chivalrous, Saladin was the Mahomedan leader at his best. See Crusades; Saracens. *Consult* Lives, Yusuf Ibn Rafi, Eng. trans. 1897; S. Lane-Poole, 1898; C. J. Rosebault, 1930.

Saladin Tithe. Tax levied in England in 1188, to procure money for the Third Crusade when Saladin had taken Jerusalem. It was the first tax levied on personal as distinguished from real property. Clergy and laity alike were taxed, except those who joined the crusade themselves.

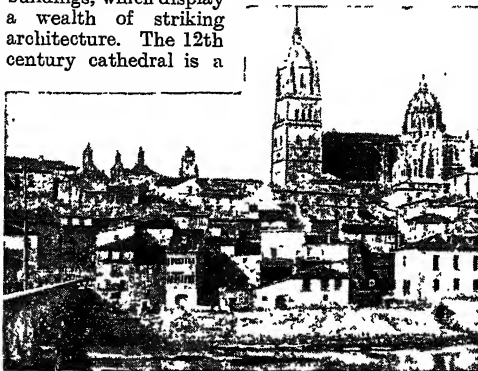
Salado, Rio (Sp. salt river). River of Argentina, in the prov. of Buenos Aires. It flows in a S.E. direction, through the Pampas, and, after a course of about 400 m., discharges into the Rio de la Plata, which it enters through Samborombom Bay, about 100 m. S.E. of Buenos Aires.

Salamanca. Prov. of W. Spain, in Leon. It is bounded N.W. by the river Douro, W. by Portugal, and S. by the Sierra de Gata. Watered by the Tormes, Yeltes, Agueda, and Alagon, it is level in the N., and generally fertile, producing cereals, wine, oil, and hemp. In the more hilly S.W. part there are forests of pine, beech, oak, and chestnut. Timber, cattle, and sheep are the chief exports. Some minerals, including gold, lead, coal, copper, and rock crystal, are found, but have been little worked. Salamanca was one of the first provs. to declare for Gen. Franco in 1936 and remained in Nationalist hands throughout the civil war. Area, 4,757 sq. m. Pop. 421,965.

Salamanca (anc. *Salmantica*). City of Spain, capital of the prov. of Salamanca. It stands on the right bank of the river Tormes, at an alt. of 2,648 ft., 172 m. by rly. N.W. of Madrid, and at the junction of five rly. lines. The river is crossed by a bridge of 27 arches, more than half being of Roman construction. The city contains many relics of the time when it was

the seat of one of the most celebrated universities in Europe, attended by over 7,000 students.

Its great colonnaded square is one of the finest in Spain, but the streets for the most part are narrow and tortuous, lined with lofty buildings, which display a wealth of striking architecture. The 12th century cathedral is a



Salamanca, Spain. City from the left bank of the river, showing the Gothic cathedral

fine example of the Transition style, while the new one, built 1513-1734, is an imposing Gothic edifice. The university, also Gothic, was founded about 1230, and in it Columbus lectured on his discoveries. There are still 25 colleges and 35 convents. The city was famous for its leather work, which is still esteemed, and there are few other industries of importance, though some cloth, linen, and pottery are manufactured.

Salamanca was already an important place when captured by Hannibal in 222 B.C. Subsequently a Roman city, it passed to the Goths and Moors before its conquest by the Spaniards in 1055. On July 22, 1812, Wellington won at Salamanca (*v.i.*) one of the decisive battles of the Peninsular War. Pop. 90,927.

Salamanca, BATTLE OF. British victory in the Peninsular War, July 22, 1812. In command of the allied army, Wellington had taken up his position S. of Salamanca, and was guarding the road to Ciudad Rodrigo, by which his communications passed to Portugal. The French army, under Marmont, changed its position with a view to capturing this road. The move was frustrated by Wellington, who rapidly moved his men to the intervening North Arapiles Hill. Sending Pakenham to attack the head of the French advancing army, he threw himself on Marmont's right flank. The battle was raging furiously when a cavalry charge, led by Sir Stapleton Cotton, swept on to the French left flank

and decided the day. Unable to re-form his scattered men, who nevertheless fought bravely, Marmont ordered a retreat to Valladolid. The numbers engaged were—Allies, 46,000; French, 42,000; the former lost 6,000, and the latter 15,000. See Peninsular War.

Salamander (*Salamandra*). Genus of tailed batrachians, allied to the newts. Consisting of three species only, they are natives of Europe and W. Asia. In general form resembling the newts (*q.v.*), they differ in having five toes on each of the short, stout limbs, in the tail being rounded instead of compressed,

and in the body being more heavily built. The palate teeth are arranged in two S-like patterns.

The species best known is the spotted salamander (*S. maculosa*) of Europe (except Great Britain), Algeria, and Asia Minor, usually 5 or 6 ins., but occasionally 8 ins. in length. It is black in colour with irregular patches of some tint of yellow on the back and limbs: warning colours, indicating that the animal is poisonous, its venom consisting of a milky fluid squirted from the pores of the smooth skin. The head is as broad as long. The females retain their eggs until the larvae are ready to hatch, then seek the water and deposit either eggs or larvae. The metamorphosis between larvae and adult stages can be induced by the addition of thyroid extract to the water. When the tadpole stage is completed the young leave the water, and live henceforth in moist situations on land, feeding upon insects, worms, snails, woodlice, etc. They hibernate underground. The Alpine salamander (*S. atra*) is somewhat smaller, and uniformly black. It is restricted in its range to the European Alps between 2,000 and 9,000 ft. altitude. The young pass through the larval stage in the body of the female. The third species (*S. caucasica*) is similar to the first, but has a larger tail and the black ground colour bears round yellow spots along the back. Its distribution is confined to the Caucasus. It was formerly and erroneously believed that the salamander could live in



Salamander. 1. Giant salamander of Japan. 2. Spotted salamander. 3. Black or alpine salamander
W. S. Berridge, F.Z.S.

fire, hence the legendary creature (v.l.) of this name. *Amblystoma*, of which the axolotl (*q.v.*) is the larva, is also called a salamander.

Salamander. Legendary creature, supposed to live in fire. It had the form of a dragon, and its skin was so incombustible that a fireproof cloth, really made of asbestos, was said to be made from it. According to Paracelsus, a salamander is an elemental spirit of the fire (see Elemental Spirits). In heraldry it is a four-legged and long-tailed creature, surrounded by flames.

Salamaua. Town and pen. of N.E. New Guinea. Formerly the administrative centre of the area under Australian mandate, the town lies on the W. coast of Huon Gulf, on Samoa harbour, a sheltered inlet between the pen. and Kela pt. on the mainland, and at the mouth of the Francisco river. Forested hills overlook the town, which is the port for the Bulolo goldfields and has air and motor-boat connexion with Lae. During the Second Great War Salamaua was the point of one of the initial Japanese landings in New Guinea on March 8, 1942, and remained for more than a year in the possession of the Japanese, who turned it into a strongly fortified base. By Aug. 9, 1943, the Australians had recovered Kela ridge commanding the town. An Australian militia unit swam the flooded



Salamander in heraldry

Cyprus, on the E. coast. The site, with some ruins, lies near Hagios Sergios, 4 m. N.N.W. of Famagusta. Founded by Greek colonists, probably about 1000 B.C., it became the chief town of the island under Evagoras its king (410-374 B.C.), who made Cyprus into one kingdom. The Romans captured it in 58 B.C. Destroyed by an earthquake, it was rebuilt by Constantius and called Konstantia. It had a famous temple.

Salamis. Island of Greece, in the Gulf of Aegina, W. of Athens. Crescent-shaped, it extends across the Bay of Eleusis, leaving two narrow straits. Its area is 36 sq. m., length 10 m. The Homeric hero Ajax, son of Telamon, was a Salaminian. The island was acquired by Athens about 600 B.C. The population, estimated at 6,000, is almost entirely Albanian.

Salamis, BATTLE OF. Naval engagement fought between the Greeks and Persians, 480 B.C. After the capture and destruction of Athens by the land forces of Xerxes, the commanders of the different contingents of the Greek fleet, then lying off Salamis, disagreed as to their future course of action. Some favoured retirement to the isthmus of Corinth, but Themistocles urged giving battle in the Strait of Salamis. The appearance of the Persian fleet in the Bay of Phalerum decided the question in his favour.

Francisco to capture the airfield on Sept. 13, and next day captured Salamaua itself, finding it almost destroyed by Allied bombing.

Salambria OR SALAMVRIA. River of Greece, anciently known as the Peneus. The principal river of Thessaly, it rises in the N.E. and flows into the Gulf of Salonica, passing near the coast between Mt. Olympus and Mt. Ossa through the Vale of Tempe, famous for its exquisite scenery. It is about 110 m. long. See Larissa.

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Salar Jung, Sir (1829-83). Indian statesman. Of aristocratic birth, he became prime minister of Hyderabad in 1853, and initiated many greatly needed military and civil reforms. A staunch supporter of the British during the critical days of the Mutiny, he maintained the loyalty of Hyderabad. In 1869 he became co-regent of the nizām, Mir Mahbub Ali, his loyalty and friendship to the British government being rewarded the next year with the G.C.S.I. He visited England in 1876, in an unsuccessful attempt to obtain Berar for the nizām's dominion. He died at Hyderabad, Feb. 8, 1883. Sir Salar Jung, whose actual name was Mir Turab Ali, was also known in India as Nawab Sahib.

Themistocles, to bring the Persians to action, thereupon sent a messenger to them, declaring that the Greeks intended to withdraw and advising them to blockade the entrances to the Bay of Eleusis, and so cut off their retreat. The Persians fell into the trap and proceeded to do so, feeling confident of success with 1,000 ships against 360. After a fight extending over several hours, victory at last rested with the Greeks. They had lost 40 ships, the Persians about 200. Xerxes, for whom a throne had been erected on Mt. Aegialeus to witness his expected triumph, disgusted with the result of the battle, returned to Asia, leaving Mardonius to carry on the campaign by land.

Sal Ammoniac. Ammonium chloride, NH_4Cl . Under the name of sal ammoniacum the salt was known to Geber, and appears to have been derived from volcanoes in Central Asia. It is obtained by neutralising the gas given off in distilling ammoniacal liquor in gas works with hydrochloric acid and evaporating the solution, or by adding sulphuric acid to the ammonia water and sublimating with sodium chloride. It is also produced in large quantities as a by-product in the ammonia-soda process. In nature it occurs in volcanic regions. It is colourless and odourless in the free state, with a strong saline taste. It is used as an electrolyte in batteries, as a flux in soldering, in dyeing and calico printing. In medicine sal ammoniac is used in bronchitis and pneumonia as an expectorant, for rheumatism, and in catarrhal affections. In photography it is sometimes added to a hypo fixing bath to obtain extra rapid fixing, especially in X-ray and oscillograph work. See Ammonia.

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Salary (Lat. *salarium*, salt money). Recompense given to a person for his labour or services, and therefore identical in law with wages. In common speech, however, it is customary to apply the term to the remuneration by the year or month of a servant of a higher class, such as a manager of a factory, while the word wages is used to describe the pay of a workman calculated on hourly or piece-work basis. See Wages.

Salazar, ANTONIO DE OLIVEIRA (b. 1889). Portuguese statesman. Born April 28, 1889, he was educated at Coimbra university, where he was to become professor of economic studies in 1916. He took to politics early in the 1920s, and became minister of finance for a few days in 1926, and again in 1928, and minister for the colonies, 1930. As prime minister from 1932, he drafted the new constitution next year which made him virtually dictator of Portugal. Foreign affairs soon came under his control, and throughout the Second Great War he adhered to a strictly neutral policy. His *Discursos e Notas Politicas*, 3 vols., 1935-44, have been translated into many languages. Consult also Portugal and her Leader, A. Ferro, Eng. trans. 1939.

Salcombe. Urban dist. and watering-place of Devon, England. It stands on the W. side of Sal-



Salcombe, Devon. A general view of Salcombe Haven, from the harbour

combe Haven, an opening on the S. coast of the county, 11 m. S.E. of Dartmouth. Noted for its mild and equable climate, it attracts visitors both in winter and summer. The nearest rly. station is Kingsbridge, whence Salcombe is reached by bus. It has a coasting trade, and at one time the Salcombe clippers were noted vessels; it is still a centre for yachtsmen. There was once a castle here. Salcombe Regis is a parish, 2 m. from Sidmouth. Pop. 2,500.

Saldanha Bay. Land-locked harbour and whaling-station of

Africa. It is 63 m. by sea N. of Cape Town. The name was at first applied to the bay later named Table Bay, where Antonio de Saldanha landed in 1503.

Saldanha Oliveira e Daun, João CARLOS, DUKE OF (1791-1876). Portuguese soldier and statesman. Born at Lisbon, Nov. 17, 1791, he fought through the Peninsular War under Wellington. After the revolution of 1820, he joined the party of John VI, whom he persuaded to



Duke of Saldanha, Portuguese soldier

issue a proclamation promising constitutional government.

After the death of John, 1826, he became minister of war. During the following years of struggle between Constitutionals and Miguelists he spent much time in exile. When, in 1834, the Constitutionalists definitely got the upper hand, he returned to Portugal, and forced Dom Miguel to capitulate. Prime minister for a few months in 1835, and again during 1846-47, Saldanha definitely secured power in May, 1851, by an insurrection against the dictatorship of Costa-Cabral, and retained it for five years. He established a ministry of reconciliation, and carried through many necessary reforms. He had the support of England while he held power. During the following years he represented Portugal at the Vatican and in Paris, and finally in London, where he died Nov. 21, 1876. Consult Memoirs of the Duke de Saldanha, Da Carnota, 1880.

Sale. Contract whereby one person, called the seller, or vendor, transfers or agrees to transfer property to another, called the buyer or purchaser, in return for a money payment, called the price. If the price is not in money, the transaction is not a sale but barter. See Auctioneering; Sale of Goods Act.

Sale. Mun. bor. of Cheshire, England. It stands on the Mersey, 6 m. S.W. of Manchester, and is connected to Manchester and Altrincham by electric rly. The town is mainly residential, and is of modern growth. There are four

large parks and recreation grounds, and two golf courses. In 1930 the urban districts of Sale and Ashton-upon-Mersey were amalgamated. Pop. 42,680.

Sale. Township of Victoria, Australia. It stands on the Thomson river, 128 m. by rly. E. by S. of Melbourne, and is the chief town in Gippsland. Pop. est. 3,500.

Salé, SALI, OR SALLÉ. Port of French Morocco. It stands at the mouth of the Bu-Regreb, opposite Rabat (*q.v.*). It gave its name to the Sallee Rovers or pirates. Pop. 52,000, including 2,000 Europeans.

Sale, GEORGE (c. 1697-1736). British Orientalist. He entered the Inner Temple in 1720 and for some time practised as a solicitor. Later he helped to revise a translation in Arabic of the N.T. for the S.P.C.K. He contributed Oriental biographies to Dr. Birch's General Dictionary, 1734, and to the Universal History, and helped to found the Society for the Encouragement of Learning, but is best remembered by his translation of the Koran, 1734, and particularly for his invaluable preliminary discourse to that work. He died Nov. 14, 1736. His MSS. are preserved in the Bodleian.

Sale, SIR ROBERT HENRY (1782-1845). British soldier. Born in England, Sept. 19, 1782, he entered the 36th Foot in 1795, and saw his first service against Tippoo Sahib and took part in the storming of Seringapatam in 1799. Further service included the Mauritius



Sir Robert Sale, British soldier

expedition, 1810, the Burmese War, 1824-25, and the Afghan War, 1838. In Nov., 1841, he was invested with about 2,000 men in Jalalabad, but was relieved after six months by Sir George Pollock. He was appointed quartermaster-general in India in 1844, but was wounded in the battle of Moodkee in the second Sikh War, Dec. 18, 1845, and died three days later. Sale exercised an extraordinary ascendancy over his men, by whom he was known as Fighting Bob.

Saleeby, CALEB WILLIAMS (1878-1940). A British physician and author. Born at Worthing, May 3, 1878, and educated at Edinburgh university, he spent some years as a medical practitioner, and then devoted himself to eugenics, writing and lecturing much upon that subject, and tak-

ing a leading part in the movements for prohibition, and divorce law reforms and sociological matters generally. His publications include *Evolution*, the *Master Key*, 1900; *The Progress of Eugenics*, 1914; *The Whole Armour of Man*, 1919; *Sunlight and Health*, 1923. He died Dec. 9, 1940.

Saleier OR **SALAYAR**. Island of Indonesia. It lies S. of Celebes, from which it is separated by Saleier Strait. A mountain chain runs N. and S., and descends steeply on the E. Padang is the chief place. The people are Mahomedans. Area, 245 sq. m.

Salekhard OR **SALEGARD**. Town of Omsk province, Siberia, R.S.F.S.R. It is about 50 m. E. of the Urals, on the Ob, and near the Gulf of Ob. A trading centre, it is the chief town of the Nentsy people living in the Samoyed peninsula on the Arctic Circle. It is linked by rly. with Berezov.

Salem. City of the Jebusites, of which, in Abraham's time, Melchizedek was king (Gen. 14, v. 18; Heb. 7, vv. 1-2). It has been identified with Jerusalem (Ps. 76, v. 2), of which it still serves as a poetical name. The Assyro-Babylonian form of the name, as given in the Tel-el-Amarna tablets, is *Uru-Salim* or *Ur-Salimmu*, city of peace.

Salem. Dist. and town of Madras state, India. The dist., formed in 1792, stretches S.E. from the E. Ghats, with the Cauvery as its W. boundary. It contains the Shevaroy Hills, which range up to 5,400 ft. alt., and include the small hill station of Yerkad. The chief crops are food grains and pulses and a little rice. The town is connected with the Madras-Calicut main rly. by a short branch line. The iron mines near by are no longer worked owing to the difficulty of obtaining smelting materials. A government weaving factory is in operation. Area, 7,073 sq. m. Pop., dist., 2,869,226; town, 129,702.

Salem. City of Massachusetts, U.S.A., a co. seat of Essex co. A port of entry, on the N. side of Massachusetts Bay, it is 16 m. N.E. of Boston, and is served by the Boston and Maine rly. and electric lines. Among its buildings are the city hall, custom house, court house, and armoury. The Essex Institute has a museum and library, and the Athenæum and the Peabody Academy of Sciences, with a valuable museum, are notable. Other buildings include churches and charitable institutions. Some interesting old houses include the one in which Haw-

thorne was born, his House of the Seven Gables, and the witch house, so called because here witches were examined. There are several public parks. Salem makes machinery, boots and shoes, lumber products, cotton goods, and leaden pipes.

One of the oldest Puritan colonies in the U.S.A., Salem was settled in 1626, and the names of John Endecott and Roger Williams are associated with its early history. In 1692 a number of persons were tried for witchcraft here, and 20 were put to death. Wealth poured into the town with the opening of the China trade in 1785, but this prosperous period ended with the war of 1812. Here in 1774 the first assembly of Massachusetts met. Salem became a city in 1835, and was seriously damaged by fire in 1914. Pop. 41,213.

Salem. City of Oregon, U.S.A., the co. seat of Marion co. and the state capital. It stands on the Willamette river, 53 m. S.S.W. of Portland, and is served by the Southern Pacific and other rlys. Its industries include fruit packing, flour milling, and the manufacture of lumber and machine-shop products and woollen goods. Settled about 1840, Salem became a city in 1853, and was chosen as the state capital in 1860. Pop. 30,908.

Salem Chapel. Novel by Margaret Oliphant. It was published anonymously in 1863 as the first of the *Chronicles of Carlingford*—



Salem, Massachusetts. Old witch house, dating from about 1631

to which later additions were The Rector and the Doctor's Family, The Perpetual Curate, Miss Marjoribanks, and Phoebe Junior. A vividly presented story of a minister and his friends, it is told with much humour and pathos. The

hero was supposed to be a fictional representation of Edward Irving.

Salemi. Town of Sicily, in the prov. of Trapani. It stands on the Castelvetro rly. line, 14 m. N.E. of Mazzara. The ancient Halicyae, it is built on a hill at an alt. of 1,450 ft., and is dominated by a castle. The town now presents an abject appearance, and its inhabitants have been characterised as extremely indolent. Here in 1860 Garibaldi proclaimed himself dictator of Sicily.

Sale of Goods Act. Statute of 1893 codifying the law relating to the sale of goods in the U.K. It introduced little new law, and was a successful attempt to compress into some 60 sections the results of an enormous number of decisions on this important business subject, together with one or two statutory provisions. It defines sale and distinguishes between a sale and an agreement to sell. The first is where the property is, by the contract itself, transferred to the buyer. The second is where the transfer of the property is to take place at a future time or on the fulfilment of a condition.

Thus, if A agrees to sell to B "this armchair," the contract of sale is complete. But if A agrees to make and sell to B "an armchair," there is an agreement for sale only until an armchair is made and appropriated to B's contract. The statute re-enacts the old Statute of Frauds as to contracts for the sale of goods of £10 and upwards not being enforceable unless they are (1) in writing; or (2) something is paid on account or as earnest money; or (3) all or part of the goods have been delivered and accepted. It also sets out what conditions and warranties are to be implied on a sale—e.g. that in a sale by sample the bulk shall correspond with the sample in quality, and shall be merchantable. Sections 16-20 define when the property passes from seller to buyer—a very important consideration, because as soon as the property has passed the goods are at buyer's risk. Other sections deal with stoppage *in transitu*, the requisites of a valid performance of the contract, the remedies of buyer and seller respectively on breach of contract, the transfer of title, sale in market overt, the rights of the unpaid seller in the goods, and auction sales. See *Auctioneering*; *Contract*; *Hire Purchase*.

Salerio. Maritime prov. of S.W. Italy, comprising the S. portion of Campania. Facing

the Mediterranean Sea, the surface is largely mountainous, being traversed by branches of the Apennines. The soil yields cereals, flax, hemp, cotton, tobacco, oil, wine, and fruit. Manufactures include paper, glass, hats, leather, and silk. Salerno was formerly the Neapolitan prov. of Principato Citra. Its area is 1,908 sq. m.

Salerno (anc. Salernum). Seaport and city of Italy, capital of the prov. of Salerno. It stands at the head of the Gulf of Salerno, 34 m. by rly. S.E. of Naples. Built on the slopes of a hill dominated by a Norman castle, its walls have been levelled and their place taken by boulevards. The cathedral, built by Robert Guiscard (1076-84), is architecturally and historically interesting, with fine bronze doors, splendid marble ambones, and ivory carvings; its roof was damaged in the Second Great War. The old city presents a quaint appearance, with narrow, tortuous streets and ancient buildings. Fruit preserving, silk and cotton spinning, and printing are carried on, and there are manufactures of glass, cement, wine, and leather. Salerno was colonised by Rome about 194 B.C. Disman- tled by Charlemagne, it was re- fortified and held by the Lombards until captured by Guiscard, and was sacked by the emperor Henry VI in 1194. In the Middle Ages its medical school was world famous, as was its university, founded in 1150 and closed in 1817. Pop. (1939) 67,000.

Salerno, GULF OF (anc. Paes- lanus Sinus). Semi-circular open- ing of the Tyrrhenian Sea in S.W. Italy. It is divided from the Bay of Naples by the promontory ending in Point Campanella, and is bounded S. by Licosa Point. It receives the waters of the river Sale, and on its shores are Amalfi, Salerno, and the ruins of Paestum.

SECOND GREAT WAR. The beaches of Salerno Gulf, between Maiori and Agropoli, were the scene, at 1.15 a.m., Sept. 9, 1943, of the third and main Allied land- ing in Italy.

As originally planned, the main landing was to have been made on Sept. 15, and near to Naples; but the Badoglio govt., after its secret surrender to the Allies on Sept. 3, was doubtful whether it could maintain itself so long without Allied support. In response to Badoglio's representations the date of the landing was therefore ad- vanced to follow immediately the announcement on Sept. 8 of the Italian surrender, and the site

chosen was closer to the troops of the Allied 8th army who were advancing against little opposition from Calabria and Apulia.

Three divs.—two British and one U.S.—in fact comprised the 5th "army" which landed at Salerno under the command of the American Lt.-Gen. Mark Clark (*q.v.*), from a great force of amphibious craft that had sailed from African ports under the pro- tection of Allied naval forces (com- manded by Vice-Adm. Henry K. Hewitt, U.S.N.). British com- mando units landed W. of Salerno and entered the town unopposed. At Maiori, still farther W., U.S. Rangers pushed inland and blocked roads leading S. through the hills. British troops who had landed S. of Salerno completed the occupation of that town on Sept. 10. At Battipaglia, inland from the centre of the gulf, however, the British met fierce German re- sistance and were driven back to the beaches, Sept. 12, by tanks which almost split the 5th army in two; and for a time, despite support by gun-fire from Allied warships offshore, the success of the landing hung on a thread. On Sept. 13 a British armoured div. which had been held in reserve was landed, and a U.S. airborne div. was dropped on the beaches and went straight into action as in- fantry. On the 14th every avail- able Allied aircraft was flung into the battle, R.A.F. and U.S.A.A.F. fighters and bombers flying more than 1,000 sorties a day, and fire from the warships in the bay con- tinued to be used to break up German tank at- tacks. Troops of the 8th army, after advancing 67 m. in three days, made con- tact with the 5th army near Agro- poli on the 17th, and the Germans began to with- draw, maintain- ing their hold, however, on the hills N. of Salerno until British troops cleared Nocera on Sept. 28, and the Allies broke through into the plain of Naples.

Salève, MONT. Isolated mt. mass of France. In the dept. of Haute-Savoie, it is 3½ m. S.E. of Geneva. It trends from N.E. to S.W. for a distance of 11 m., and is divided by the Monnetier depres- sion into the Petit-Salève, alt.

2,950 ft., and the Grand-Salève, culminating in the Crêt de Grange Tournier, alt. 4,524 ft. It com- mands a view of Mont Blanc and the Rhône valley, and is ascended by a mountain rly. to Treize Arbres, alt. 3,746 ft.

Salford. City and county borough of Lancashire, England. It stands on the W. bank of the Irwell, which



Salford arms

divides it from Manchester. It is 190 m. from Lon- don, and is served by British rlys. and has a com- prehensive ser- vice of omni- buses. The chief buildings are the town hall, muni- cipal buildings, technical institute and museum, and art gallery. The town has hospitals and many modern churches. With a large Roman Catholic population, it has a fine Roman Catholic cathedral. Of many open spaces, the chief are Peel Park, Albert Park, Buile Hill Park, and Kersal Moor.

The industries resemble those of Manchester, prominent being the making of cotton goods and chem- icals, while there are large engineer- ing works. Here are the principal docks of the Manchester Ship Canal, and the Manchester racecourse lies within the boundaries of Salford. Salford received its first charter in 1231. Its charter of incorporation dates from 1844, and in 1853 it was enlarged by the addition of Broughton and Pendleton, hitherto separate areas, each with a town hall. In 1926 it was made a city.



Salford, Lancashire. The town hall

From 1832 to 1885, and after 1950, Salford had two M.P.s., three from 1885 to 1950. Its water supply is provided by Manchester. Pop. 175,230. See Manchester.

Salicaceae. Family of trees and bushes, widely spread in the N. hemisphere: sometimes com- prised in the Amentaceae (*q.v.*). See Willow.

Salicin (Lat. *salix*, willow). Crystalline glucoside prepared from the bark of various species of willow and poplars. It occurs as colourless, intensely bitter crystals, and is used in medicine in almost the same way as salicylic acid (*q.v.*).

Salic Law. Code of law of the Salic or Salian Franks of the 5th century A.D. The term in contemporary usage is applied to a law of succession debarring females and those who trace their descent through females from succeeding to the throne. Such a law exists *e.g.* in Denmark. See Franks.

Salicylic Acid, OR ORTHO-HYDROXYBENZOIC ACID. Acid occurring in ester form in many essential oils and plant products, *e.g.* oil of wintergreen, which contains more than 98 p.c. of methyl salicylate. It may be prepared from such natural sources or synthetically by the action of carbon dioxide or sodium phenate. When pure it is in crystals, usually fine needles or a white crystalline powder, with a sweetish, afterwards acrid, taste. It is a powerful antiseptic widely used as a food preservative, though its use for that purpose is forbidden in some countries. Salicylic acid is used in medicine as its salt, sodium salicylate. Acetylsalicylic acid is the chemical name for aspirin, which is non-irritant.

Salient (Lat. *salire*, to spring forward). Term particularly indicating that part of a defence line or series of fortifications which projects in front of the main line towards the enemy. A salient angle has the apex outwards. Examples were the salients at Ypres and St. Mihiel in the First Great War.

Salieri, ANTONIO (1750-1825). Italian composer. Born at Legnano, Aug. 19, 1750, he first attracted attention with his opera *Armida*, 1771, and in 1774 became musical director at Vienna. The contemporary and bitter rival of Mozart, whose death he was at one time supposed to have caused by poison, he retired in 1824, and died May 7, 1825, having taught both Beethoven and Cherubini. One of his best-known works was *La Grotto di Trofonio*, 1785.

Salii. College of priests of Mars at ancient Rome. At the festival of Mars held in March they went in procession through the streets engaging in the dances in honour of the god from which they took their name, the "leaping" priests (Lat. *salire*, to leap, dance).

Salina, OR SALINA LAKE. Term for lakes or dried lake-beds in desert regions which, owing to evaporation, are rich in salt,



Salisbury, Wiltshire. The 14th century cathedral from the north-west

sodium sulphate, alkalis, or borax, used when the surface of the lake-bed is covered with efflorescent minerals. See Playa.

Salina Cruz. Pacific port of Mexico, on the Gulf of Tehuantepec. It was the terminus of the transcontinental Tehuantepec rly., built 1899-1907 by British engineers, destroyed during internal Mexican warfare of the 1910's. The concrete breakwaters that protect the harbour are over a mile in length. It is 190 m. S. of Puerto Mexico on the Caribbean. Pop. 6,000.

Saline (Lat. *sal*, salt). Term loosely used for substances containing salts of various kinds. Salines, in medicine, consist of, or contain chiefly, salts of the alkaline metals or magnesium. The effervescence which some salines exhibit when mixed with water is due to the chemical reaction of an acid (tartaric or citric) with an alkaline salt (usually sodium carbonate or bicarbonate), resulting in the evolution of carbon dioxide.

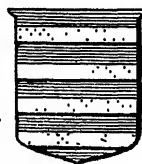
Salins. Town of France. In the dept. of Jura, it is 22 m. S. of Besançon, standing in the valley of the Furieuse. The name is derived from the salt springs, which attract many visitors. Some trade is done in wine and timber. The chief buildings are the Romanesque church, the hôtel de ville, and a museum. In the Middle Ages Salins was part of Burgundy. It passed to the Hapsburgs, only becoming part of France in 1674. Pop. est. 5,000.

Salisbury. City and mun. bor. of Wilts, England, also the county town. It stands on the Avon, 84 m. by rly. S.W. of London. The glory of Salisbury is its cathedral,

a perfect specimen of Early English work, beautifully situated near the Avon. Built almost wholly in the 13th century, it is 473 ft. long and the spire at 404 ft. is the highest in England. Notable for its perfect proportions and the uniformity of its style, its features include cloisters, chapter house, lady chapel, and library. It was damaged by restoration in the 18th century, but much of the evil was undone in the 19th. (*Consult* Salisbury Cathedral, J. Truby, 1948.)

Around is the spacious close from which gates lead to the city; in it are a number of old buildings, notably King's House, renovated for a training college; the bishop's palace, which became a cathedral school in 1946, when the bishop took up residence at Mompesson House; also several houses occupied by members of the cathedral staff. Other churches include S. Thomas's, founded as a chapel to the cathedral in the 13th century; S. Martin's, and S. Edmunds, originally collegiate.

The secular buildings include the court house, markets, corn exchange, and a museum. The city has a large market place, with statues of Henry Fawcett and Sydney Herbert, and the poultry cross still stands. The hall built by John Halle, the Joiners' Hall, and Audley Hall—as it is sometimes called—now the church house, are notable. Victoria Park, 16 acres in extent, commemorates the jubilee of Queen Victoria. S. Nicholas Hospital is noted for its



Salisbury arms

beautiful chapel. Of many interesting houses may be mentioned the Old George Inn. The city proper is laid out in squares known as chequers. The industries include brewing, and Salisbury is an agricultural and also a military centre.

Salisbury was founded in 1220 by Bishop Poore, who decided to move his cathedral city from Old Sarum to its present site. The city, sometimes called New Sarum, grew up around the cathedral which he built. It was almost at once made a corporate town and became the county town. Here in the 13th and 14th centuries several parliaments were held, and the kings, as late as Charles II, occasionally stayed here. It became famous for its manufacture of woollens and cutlery and had strong trade guilds. The bishop had great authority in the city during the Middle Ages, partly retained until 1835, when the existing corporation was established. Salisbury had two M.P.s until 1885, then one until 1918; it now gives its name to a co. constituency. Market day, Tues. Pop. 31,624. See Chapter House; Georgian; Parapet; Sarum.

Salisbury. City of Rhodesia, the capital of S. Rhodesia. It stands at an altitude of 4,825 ft., and is 300 m. by rly. N.W. of Bulawayo and 1,660 m. N.W. of Cape Town. An aerodrome 2 m. W. of the town is the headquarters of the S. Rhodesian air services. The buildings include government house, town house, library, market hall, and drill hall. The new high court here, opened in 1933, houses the ministries of Finance, Justice, Defence, and Mines and Public Works. There is an Anglican cathedral. A statue of Cecil Rhodes stands in front of the government buildings. The town has public gardens, theatres, a racecourse, and other facilities for amusement. The site was occupied by the British in 1890, and named Fort Salisbury in honour of the prime minister; it became a city in 1935. Pop. 69,049.

Salisbury. City of N. Carolina, U.S.A., the co. seat of Rowan co. It is 115 m. W. of Raleigh, and is served by the Southern rly. Textile plants here produce yarn and cotton blankets; there are also extensive granite quarries. In

Salisbury prison over 3,000 Northern captives died during 1864-65. Founded about 1752, Salisbury was incorporated in 1755 and became a city in 1770. Pop. 19,037. Another Salisbury is in Maryland. Pop. 13,313.

Salisbury, EARL AND MARQUESS OF. English titles now held by the family of Cecil. The title of earl was granted about 1149 to Patrick de Salisbury, a feudal lord in Wiltshire. A later earl was William Longsword, a natural son of Henry II, who married the heiress of an earlier earl. It passed then through two female descents to a certain Alice who married Thomas Plantagenet, earl of Lancaster.

The title was granted to William de Montacute in 1337, but again lapsed by the attainder of the 3rd Montacute earl in 1400. However, it was granted in 1409 to his son, Thomas de Montacute, the earl who won fame as a soldier in France, where he was killed in 1428. From him it passed to his son-in-law, Richard Neville, falling into abeyance when his son Richard Neville, earl of Warwick, was killed in 1471. Further grants of the earldom were made to members of the family of Plantagenet. One of these, Edward, a son of George, duke of Clarence, lost the title, but it was restored to his sister, Margaret, the widow of Sir Richard Pole, in 1513. This lady and her sons became objects of suspicion

the Civil War, but the succeeding earls were not specially distinguished. James, the 7th earl, lord



2nd Marquess of Salisbury, British politician

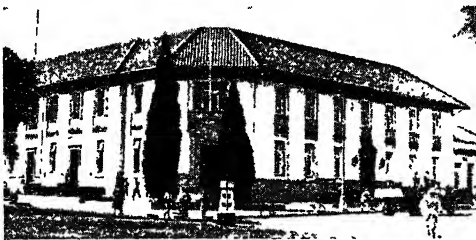
chamberlain, 1783-1804, was made marquess of Salisbury in 1789. James, the 2nd marquess (1791-1868), was lord privy seal, 1852, and lord president, 1858-59. His marriage with Frances Mary Gascoyne introduced that name into the family. Their son, the 3rd marquess, was the prime minister, and he, and the 4th and 5th marquesses, are separately noticed. The eldest son of the marquess is known as Viscount Cranborne. The family seat is Hatfield House. See Burghley, Lord; Cecil; Hatfield.

Salisbury, ROBERT CECIL, EARL OF (c. 1565-1612). English statesman. A younger son of Lord Burghley, he was educated at Cambridge and soon became an M.P. Trained by his father, he became engaged in political and diplomatic work, and in 1596 was secretary of state. He succeeded his father as Elizabeth's chief adviser, and also advised James I. From 1608 until his death, May 24, 1612, he was also lord treasurer.

Salisbury, ROBERT ARTHUR TALBOT GASCOYNE-CECIL, 3RD MARQUESS OF (1830-1903). British statesman. He was born at Hatfield House, Feb. 3, 1830, second son of the 2nd marquess, and was educated at Eton and Christ Church, Oxford. In 1853 he



Robert Cecil, Earl of Salisbury, English statesman



to the Tudor sovereigns; and in 1539 the countess was attained.

In 1605 Robert Cecil, son of the great Lord Burghley, was created earl of Salisbury, and the title has since been held by his descendants. The 2nd earl was a parliamentary leader during



Salisbury, S. Rhodesia. Upper picture shows the post office; lower picture, First Street, a shopping thoroughfare

was elected fellow of All Souls, and in the same year, as Lord Robert Cecil, was returned unopposed as Conservative M.P. for Stamford, a constituency he represented for the next 15 years. During 1859-66 his reputation grew rapidly with his incisive attacks upon the Russell ministry. In 1865 he became Viscount Cranborne on the death of his elder brother, and in 1866 took office as secretary for India, though he resigned the following year after disagreeing with Disraeli's proposals for franchise reform. In 1868 he succeeded to his father's title, and returned to the India office in 1874. In 1878 he succeeded Lord Derby at the foreign office during the war between Russia and Turkey, and was almost immediately Lord Beaconsfield's colleague at the congress of Berlin, helping to bring back "peace with honour." The Liberal electoral victory of 1880 terminated his tenure of the foreign secretaryship, but on Beaconsfield's death in 1881 he was chosen leader of the opposition in the lords.

On the fall of the Liberal government in June, 1885, Salisbury became prime minister for the first time, combining the office with that of foreign secretary. The government was short-lived, Gladstone resuming office in Dec. But the subsequent general election, fought on the question of Irish Home Rule, brought a decisive majority of Conservatives and Liberal Unionists. Salisbury offered to serve under Lord Hartington in order that Liberal Unionists might be included in the administration; but this offer being declined, he became premier again 1886-1892, with foreign affairs still entirely under his control. He granted royal charters to the British E. Africa Co. (1888) and the S. Africa Co. (1889), and came to agreements with France (in respect of Madagascar) and Germany (ceding Heligoland to that country) in 1890.

In opposition 1892-1895, he was returned to power in the latter year, remaining prime minister until his resignation in July, 1902. The early disappointments of the S. African War told on his health. He was anxious to resign after the election of 1900, which confirmed his party in power; but Queen Victoria persuaded him to remain, though he handed over the foreign office to Lansdowne. He remained premier to the end of the war, resigning six weeks after peace was signed. After one year of retirement, he died Aug. 22, 1903.

Salisbury was a Conservative of the old school, an aristocrat, distrustful of democracy, which he regarded as fatal to the liberty of the individual. He displayed unconcealed indifference for public



Russell

Salisbury

opinion, yet the public came to trust him implicitly, putting faith in his massive experience and his demonstrable lack of self-interest. His policy was uniformly pacific, aiming at the maintenance of the balance of power. At home he was a stalwart defender of the Established Church.

He was elected chancellor of Oxford university in 1869, was made a K.G. and appointed lord warden of the Cinque Ports. He was president of the British Association in 1894. In his early parliamentary days he was a regular contributor on political subjects to the Saturday Review and Quarterly Review. Volumes of his essays were published posthumously. He married in 1857, and his family included his eldest son, who succeeded him as 4th marquess, and Lord Robert (later 1st Viscount Cecil of Chelwood, *q.v.*), Lord Hugh (later Baron Quickwood, *q.v.*), and Lord William Cecil, who became bishop of Exeter. *Consult* Life, Lady G. Cecil, 4 vols., 1921-31.

Salisbury, James Edward Hubert Gascoyne-Cecil, 4th Marquess of (1861-1947). British politician. Eldest son of the 3rd marquess, he was born Oct. 23, 1861, and educated at Eton and University College, Oxford. As Viscount Cranborne, he entered politics in 1885 when he represented Darwen as Conservative M.P., retaining his seat until 1892,

and transferring to Rochester next year. In 1900 he entered his father's administration as under-secretary for foreign affairs. He succeeded to the title in 1903, became lord privy seal, and in 1905 president of the board of trade. Salisbury was Conservative leader of the house of lords, 1925-31. Though he gave valuable service as member of the committee on Indian constitutional reform, 1934, he was a prominent opponent of the government's policy in India. He died April 4, 1947, and was succeeded by his eldest son (*v.i.*).

Salisbury, Robert Arthur James Gascoyne-Cecil, 5th Marquess of (b. 1893). British politician. Eldest son of the 4th marquess, he was born Aug. 27, 1893, and educated at Eton and Christ Church, Oxford. As Viscount Cranborne he represented S. Dorset as Unionist M.P. from 1929, and was parl. under-secretary for foreign affairs, 1935-38, resigning with Anthony Eden as



5th Marquess of Salisbury, British politician

a protest against Chamberlain's policy toward Mussolini and Hitler. Secretary for dominion affairs, 1940-42 and 1943-45, he spent a period between as lord privy seal.

That he might sit in the house of lords during his father's lifetime, he was created in 1941 Baron Cecil of Essendon, and became leader of that house in Winston Churchill's administration, but was still known as Viscount Cranborne until he succeeded to the marquessate on his father's death, April 4, 1947.

Salisbury, Frank O. (b. 1874). British painter. Born Dec. 18, 1874, he studied at Heatherley's



Frank O. Salisbury, British painter

and the R.A. schools, exhibiting regularly at Burlington House from 1899. He executed portraits of George V and Queen Mary, George VI and Queen Elizabeth,



4th Marquess of Salisbury, British politician

Winston Churchill, General Smuts, several American presidents and ambassadors, and Mussolini. Royal occasions called forth other canvases, e.g. the silver jubilee of 1935, the coronation of 1937, the visit to Canada in 1939. Twelve of Salisbury's panels are part of the Victoria Memorial at Calcutta. He painted Alfred the Great rebuilding the walls of London; Catherine of Aragon before the consistory courts; and other historical panels for the Royal Exchange. His *Burial of the Unknown Warrior* is in the houses of parliament.

Salisbury, OATH OF. Oath of allegiance sworn by his tenants and their vassals to William the Conqueror at the moot or council of Salisbury in 1086. This oath definitely differentiated English from Continental feudalism (q.v.).

Salisbury Island. Naval base in Durban Bay, Natal, South Africa. Part of the magisterial district of Durban, it was formerly a convict settlement. During the Second Great War it was converted into a naval base at a cost of £2,000,000. The island is linked to the Bluff by rly. and road, and can accommodate any warship.

Salisbury Plain. Dist. of Wiltshire, England. Composed of rolling chalky downs, it is about 20 m. long by 15 broad, lying in the S.E. of the county to the N. of Salisbury. The highest point is Westbury Down (770 ft.), and the Avon flows across it. On the plain is Stonehenge, as well as Amesbury and other villages, but the greater part is used for military purposes. The principal camps are at Tidworth (Royal Armoured Corps), Bulford, Larkhill (Royal Artillery), while the R.A.F. has aerodromes at Netheravon and Upavon (Army Cooperation). Amesbury and Bulford are served by rly. See Stonehenge.

Salisbury Square. London square, off the S. side of Fleet Street, E.C. Formerly known as Salisbury Court—which is now the thoroughfare joining it to Fleet Street—it was the site of Salisbury, later Dorset, House, residence of the bishops of Salisbury. Here stood Salisbury Court Theatre, 1629–66. Here Samuel Richardson had his printing office, wrote Pamela, printed Maitland's London, and employed Goldsmith as proof-corrector. Pepys was born in Salisbury Court; Betterton, Shadwell, and Dryden were residents. In the adjacent Hanging Sword Alley was Blood Bowl House, depicted in Hogarth's *Industry and Idleness*, plate 9; and

the home of Jerry Cruncher, in Dickens's *Tale of Two Cities*. See Fleet Street.

Salish. American Indian stock in British Columbia, and the states of Washington, Idaho, Montana,



Salish Indian from Montana

and Oregon, U.S.A. They number perhaps 10,000 in Canada and 8,000 in the U.S.A. The true Salish tribe, now congregated at Flathead agency, Mont., are officially known by the early nickname Flatheads, although they never practised head deformation. They are typical of various inland hunting tribes, such as the Thompson river Indians congregated at Kamloops and Lytton, B.C.

Saliva (Lat., spittle). Secretion poured into the mouth from the salivary glands. It contains about 0.5 p.c. of solids, chiefly mucin and ptyalin, and is slightly alkaline. The functions of the saliva are twofold: first, to moisten and lubricate food, thereby facilitating swallowing; secondly, by virtue of its ptyalin, to act upon starchy constituents of the food, preparing them for absorption by splitting them into simpler sugars. Saliva plays a part in preventing decay of the teeth, as it counteracts local acid reactions in the mouth.

The salivary glands are made up of lobules in which the saliva is secreted. They are three in number on each side, namely, the parotid gland (the largest), lying between the ear and the upright part of the lower jaw; the sub-maxillary gland, lying low down inside the horizontal part of the lower jaw; and the sub-lingual gland, under the mucous membrane of the floor of the mouth.

Secretion of saliva is to a considerable extent under the control of nervous stimuli. To see or smell savoury food causes the "mouth to water," as may the mental suggestion of any salivary stimulant. In this connexion is told the old story of the trombone player who lost a competition because his adversary spoke to him about lemons. Conversely, there is the Oriental presumption of guilt

when a mouthful of rice given to a suspected man is spat forth unaltered, fear having dried the secretion of saliva.

Salivation. Excessive flow of saliva. It may be due to ulceration of the mouth, or to chronic poisoning by mercury and certain other drugs. It was once commonly seen in persons taking mercury for the treatment of syphilis.

Sall, ANDREW (1612–82). Irish scholar. Born at Cashel, he was educated at St. Omer, and became a Jesuit. He was rector of the Irish college at Salamanca, 1652–55, and professor of divinity at Pamplona and other places in Spain. Returning to Ireland about 1664, he underwent a change of belief, and in 1674 he publicly joined the Church of England at Cashel. After taking the degree of D.D. at Trinity College, Dublin, he went to Oxford, going back, in 1680, to Dublin where he died April 5, 1682. He wrote *A Declaration for the Church of England*, 1674, in defence of his change of faith. His ed. of the Bible in Irish was uncompleted at his death.

Sallé. This town of French Morocco is described under its alternative spelling of Salé.

Sallow (*Salix caprea*). Tall shrub belonging to the family Salicaceae. Known also as goat willow, and, popularly, as palm and pussy willow, it grows in woods, thickets, hedges, and along streams throughout Europe and temperate Asia to the Arctic Circle. Common in Britain, it flowers in early spring, and is distinguished by its cottony down and wrinkled leaves.

Sallust (86–34 B.C.). Roman historian whose full name was Gaius Sallustius Crispus. He was



Sallust, Roman historian

born at Amiternum in central Italy and had a distinguished public career, his offices including those of tribune (52), praetor (46), and ending with the governorship of Numidia, a post he owed to Julius Caesar, with whose fortunes he had been largely associated. Returning to Rome a wealthy man, Sallust passed his time in luxurious retirement, devoting himself to literature.

Only two of his works have been preserved complete, histories of the war with Jugurtha, and of the conspiracy of Catiline. His chief effort, of which only fragments

remain, was a history of Rome from 78 to 67. Sallust ranks high as a scientific historian, though his chronology and geography are often confused. Although a partisan, a moralist, and a pessimist, he is free from prejudice, and took great pains to make sure of his facts. In the *Jugurtha* he made a careful study of all original documents available. Thucydides was avowedly his model. Sallust's style is curiously unlike that of his contemporaries (Cicero and Caesar; in his fondness for antithesis, pointed brevity, and other rhetorical characteristics, he anticipates the prose which came into vogue a hundred years later.

Sally Lunn. Form of thick teacake which is cut open, toasted, and buttered. The buns were first made by Sally Lunn, of Bath, who sold them in the street in 1797. The following year a Bath baker and musician named Dalmar bought her business and wrote a song called Sally Lunn. The shop from which Dalmar sold the buns survived German air attacks on Bath during the Second Great War.

Salmasius, CLAUDIUS. Latinised name of the French scholar Claude de Saumaise (1588-1653).



Claudius Salmasius,
French scholar

Born at Sémur, Burgundy, April 15, 1588, he studied in Paris and Heidelberg. Vast classical learning won for him in 1631 a professorship at Leyden, and his reputation was European. He is chiefly remembered for his Latin defence in 1649 of Charles I, to which Milton replied; but his great work was his commentary on the *Polyhistor* of Solinus. Salmasius, who became a Protestant when at Heidelberg, and was a pupil of Casaubon, died Sept. 3, 1653.

Salmon (*Salmo salar*). Large food fish of the sub-class Neopterygii, family Salmonidae, inhabiting the seas and rivers on both sides of the Atlantic; in Europe from the White Sea to N. Spain; and in America from Cape Cod to Ungava Bay. In Maine and New Brunswick it is found in landlocked lakes. It is elongated in form, the upper side slightly curved, the underside more so, and the length five and a half times the greatest height.

Large salmon are about 4 ft. long, but may be 5 ft.; and weigh from 20 lb. to 40 lb., though occasionally they turn the scale at 60

lb. In common with the other members of the family, the salmon bears a second dorsal fin, though this is without rays, and is composed of fatty tissue. Adult salmon, in the sea or ascending the rivers, have the upper side of a dark blue colour paling to bright silver on the sides and under parts, the sides

more or less spotted with X-like or star-shaped marks. After their return to the streams for the purpose of spawning the silver becomes coppery. The flesh is pink.

The spawning season is some time between Sept. and Feb., but chiefly in Nov. and Dec., the salmon that have reached maturity in the sea entering the estuaries of favourite rivers, and journeying many miles up stream to reach the shallow waters near the source. They do not feed in fresh water, and consequently their condition deteriorates, until after spawning, when they return to the sea and are called "kelts." To reach the breeding grounds they have often to overcome considerable obstacles, such as waterfalls, and to do so leap clear of the water from pool to pool. As soon as they arrive at the selected spawning ground, the female scoops out a deep trough or "redd" in the gravel bottom and deposits her eggs, laying 800-900 eggs for every pound of her weight. The male follows close behind and fertilises them; they are then covered with gravel, and other redds are constructed and furnished. The eggs hatch in from a month to five months, according to conditions and the larval salmon quits the egg furnished with a yolk sac containing sufficient nourishment to sustain it for some weeks. This is known as the "alevin" stage, and at its termination the fish, now nearly a year old, becomes a "parr," of an olive tint, the back dark, the sides barred and spotted, and the underside white. About six months later—that is, in their second spring or summer—their backs assume a bluish tint, and the sides and under parts become silvery. They are now "smolts," and leave the narrow streams for the broader river, where they congregate in large companies, before starting on their journey seaward.

Hitherto, they have fed upon worms and insects, and have attained a length of about 5 ins.

Little is known of their life in the sea, but the evidence from marked smolts of two or three ounces that

have returned to fresh water a year later weighing from two to five pounds, shows that the change of diet results in rapid development. Most of them do not return for another year or two, and may be

as heavy as 10 lb. or more. These returned fish are "grilse," and mostly sexually mature males. The females and many males remain at sea for several years longer, feeding chiefly upon herrings, and ascend the river at varying ages. Although the migratory behaviour described is that, according to recent research, which is habitual among salmon, in Canada it is by no means rigidly fixed and incapable of variation.

The life-history of an adult salmon is recorded in its scales, the concentric ridges of its surface which mark its growth being fine and close when formed in fresh water, bolder and with wider spaces when added in the sea, and the fact that the fish has spawned is indicated by the fraying of certain rings. Many of the marked smolts that have gone to sea return after one or two years as grilse to the river of their origin.

SALMON FISHING. The right of fishing a salmon river belongs to the riparian landowners, who often lease the sporting rights for very large rents. The capture of salmon on economic lines is effected by nets when the fish are proceeding up the river for spawning. British salmon fisheries are estimated to produce food to the value of £1,000,000 a year; those of British Columbia are of greater value. There is a close time for salmon in English waters; usually between Sept. 1 and Feb. 1 for nets, and between Nov. 1 and Feb. 1 for rods. See Angling; Close Time.

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Salmond, SIR JOHN MATTHEW (b. 1881). British airman. Born July 17, 1881, son of Major-Gen. Sir W. Salmond, he entered the army in 1901, and served in South Africa, 1901-02. He learnt flying at his own expense and



Salmon leaping while being played on a line

joined the R.F.C. in 1912, becoming instructor at the central flying school at Upavon. He reorganized the system of training British airmen, and in 1917 became director-general of military aeronautics. In Jan., 1918, he succeeded Sir



Sir John Salmond,
British airman

H. M. Trenchard (*q.v.*) as head of the fighting air force in France, and under him it definitely established its ascendancy over the Germans. In 1922 he became commander of the R.A.F., Iraq (Mesopotamia), retiring from that post in 1924. Made a major-general in 1918, he became air vice-marshal and received the K.C.B. in 1919. He was c-in-c. Air Defence of Great Britain, 1925-29, visiting Australia and New Zealand in 1928 to make recommendations for future development. Chief of the air staff in 1930, he was made G.C.B., 1931, and retired in 1933 with the rank of marshal of the R.A.F. He became a director of Imperial Airways in 1933 and in 1939-45 was director of armament production at the ministry of Aircraft Production.

Salmond, SIR WILLIAM GEORGE FREY HANSON (1878-1933). British soldier and airman. Born Aug. 19, 1878, and brother of Sir J. M. Salmond (*v.s.*), he entered the army, 1898, and served in the South African War, 1899-1902. He joined the R.F.C., 1913, and in the First Great War, after serving on the staff and commanding a brigade, was employed in the Air Ministry from April, 1918. Appointed to command the R.A.F. in Egypt in 1919, he made a long-distance flight from Egypt to Delhi in Dec. of that year. He was made director-general of supply and research, R.A.F., in Oct., 1921, and in 1927 went to India to command the R.A.F. there, where in 1928 he took charge of the British evacuation of Kabul by air. Appointed c-in-c. Air Defence of Great Britain in 1931, he died on April 27, 1933.

Salmon Fungus (*Saprolegnia ferroz*). Mould-like fungus of the family Saprolegniaceae, which was long supposed to produce the salmon disease. It forms greyish patches upon the parts of the fish not protected by scales. These patches are at first about $\frac{1}{4}$ of an inch in diameter, but soon increase and join up with adjacent patches. The skin beneath is deeply

ulcerated. The whole of the back and sides and the mouth become involved, and the death of the salmon follows. The fungus takes the form of delicate threads similar to those of the moulds, and is propagated by the production of zoospores in capsules (sporangia), which burst to liberate them, and for a short time the zoospores have the power of movement through the water. On coming into contact with a sickly fish they germinate.

Salmon Trout. Alternative name for sea trout (*Salmo trutta*), a fish closely related to the salmon. In the sea this trout ranges from Iceland and N. Europe to the Bay of Biscay, and as a fresh-water fish extends to S. Europe and Sardinia, Algeria, and Morocco. It is silvery in colour, with X-shaped blackish spots. At breeding times it ascends rivers and enters lakes where it forms colonies. The average sea trout weighs about 8 lb. 4 oz., though in large lakes it is reputed to attain 50 lb.

Salol ($C_{13}H_{10}O_3$). Phenyl salicylate. It is prepared by the action of salicylic acid on phenol, and forms colourless, almost tasteless crystals. It is used in medicine as an intestinal disinfectant, but its value is questionable.

Salômê. Sister of Herod the Great, assassinated for plotting against his sons. Another Salômê was the daughter of Herodias, who, at her mother's instigation, danced before Herod Antipas, and as a reward was granted the head of John the Baptist. This was the name also of the sister of Mary, the mother of Jesus. Oscar Wilde wrote in French a play called Salome, produced in Paris in 1894 with Bernhardt as lead, and in London at the Bijou Theatre, Bayswater, May 10, 1905. Salome is also the name of an opera by R. Strauss, 1905. See Herod; Herod Antipas; John.

Salon or **SELUNG**. Burmese name for an Indonesian tribe of nomadic fishers in the Mergui archipelago. Calling themselves Mawken (sea-drowned), and numbering about 1,900, these "sea-gypsies" appear to have been land-dwellers in the Indo-Chinese peninsula, akin to the Chams, before they were forced by the pressure of stronger immigrant peoples to take to boats. Short, brownish, and lank-haired, they have no fixed villages or agriculture.

Salon. In general, a room used for the reception of guests, a drawing-room. The term is often applied to the literary or social groups centring round some lady whose house is their recognized

meeting-place, as was Holland House (*q.v.*) in the 18th century. In France salons have greatly influenced political, literary, and artistic life, e.g. those of Catherine de Vivonne at the hôtel de Rambouillet and those known by the names of Scudéry, Scarron, De Lespinasse, Necker, De Staël, etc.

L'ancien salon—in short, the Salon—is a French exhibition of fine art held annually in Paris. Since 1890, when Meissonier headed the schism that resulted in the formation of the Société Nationale des Beaux Arts, the "old" Salon, which represents the Société des Artistes Français, constituted in 1880, has been less conspicuous. Exhibitions of painting and sculpture were organized as early as 1648. It was established in the Champs Elysées in 1856.

Salona. Village of Yugoslavia, in Dalmatia. Formerly an important Roman city, its prosperity was greatest about 300; in 535 it was sacked by the Goths. Spalato, $3\frac{1}{2}$ m. away, was built round the empty palace of Diocletian, who was born here. Many ruins of the ancient city were laid bare by excavations during the 19th century.

Salonica or **SALONIKA** (Gr. *Thessaloniki*). City of Greece. Situated at the head of the gulf of the same name, Salonica is the terminus of the rly. from Belgrade-Nish, has a branch line W. to Monastir, and a line E. through Doiran, Serres, and Drama, which connects with the trunk Sofia-Istanbul rly. It has a magnificent harbour, and when under Turkish rule was the second port of the Turkish Empire.

The city was founded from Corinth in 315 B.C., and became the capital of Macedonia. S. Paul knew it as Thessalonica, and addressed the two Epistles to the Thessalonians to its Christian people. The Saracens captured it in 904, Venice held it during the Middle Ages, and it passed to the Turks in 1430, until 1912, when it capitulated to the Greeks.

The people are mostly Jews, the descendants of Jews who fled from persecution in Spain and settled there, and they speak a corrupt form of Spanish called Ladino.

Salonica has an imposing appearance, as it rises from the shore in a series of terraces to the turreted citadel. It was half destroyed by fire, Aug. 18, 1917. Pop. 236,524.

FIRST GREAT WAR. Salonica was a base for Allied campaigning from 1915 to 1918. A British-French force landed there, Oct. 3-8, 1915, in anticipation of a Bul-

garian declaration of war, although Greece was a neutral state. Venizelos, the Greek premier, made a formal protest and resigned, but his successor, Zaimis, promised that Greek neutrality would be benevolent towards the Allies. By the end of Oct. the Salonica Expeditionary Force (called in France the Army of the Orient) consisted of 30–40,000 men, mainly French. On the invasion of Serbia by Bulgaria, Oct. 11, the Allied troops moved forward from Salonica, but were unable to gain touch with the Serbian army. But it was decided to hold Salonica as a base for future operations and personnel was increased to eight divisions, three French, five British. A fortified line, 50 m. long, was drawn around the city. During the winter of 1915–16 the force grew to 300,000, to whom were added 100,000 Serbians from Corfu in May, 1916, and Russian and Italian forces later in the summer.

Advances from Salonica were made in June and July, and the French linked up with the Serbians at a point W. of the Varda. The British, under Gen. Milne, occu-

pied the R. bank of the Struma. In Aug., the Bulgarians attacked this line in force, and gained some temporary successes against the Serbians. To help Rumania, who had joined the Allies, Gen. Sarrail, the French c.-in-c., ordered a general offensive in Sept. In the subsequent action Monastir was occupied by French and Russians. Trench warfare followed until Feb., 1917, after which further Allied advances were made against the Bulgarians and Germans. In May, another general offensive was less spectacular in its gains, and the stalemate position remained until Sept. 15, 1918, when a further offensive ordered by Gen. Franchet d'Esperey, the new French c.-in-c., resulted in the unconditional surrender of Bulgaria a fortnight later, followed by the expulsion of Germans and Austrians from Albania (Nov. 1), Serbia (Nov. 3), and Montenegro (Nov. 4). Part of the Salonica army was marching through Rumania towards Bukarest when the end of hostilities came on Nov. 11.

SECOND GREAT WAR. Salonica was bombed from the air several times by the Italians after their invasion of Greece, Oct. 28, 1940, six raids occurring on Nov. 1. The city fell to the Germans April 9, 1941, when they entered Greece over the Rupel pass from Bulgaria; and it remained in German occupation until they with-

drew after destroying port installations shortly before British patrols reached there on Nov. 1, 1944. A larger British force landed from the sea Nov. 4 and set to work to restore the port to use. One quay, 300 yds. long, was called the Lancashire quay, having been constructed by Royal Engineers from that county.

Salop. Alternative name for the English county Shropshire. It is said to be derived from an old name for the capital, Shrewsbury. It is not, as is often supposed, an abbreviation.

Salopian. In geology, a time period of the Silurian (*q.v.*) system, now divided into the Wenlock and Ludlow series. The name is derived from Salop or Shropshire, where strata of this period are well known at Wenlock and Ludlow.

Salpa. Genus of the Tunicata, a class of marine chordates, found in large numbers in many seas. There are about 15 species of Salpidae, each occurring in asexual and aggregated sexual forms. The two forms alternate regularly. They are free-swimming animals, unlike many of the Tunicata, which fix themselves to shells or stones at the bottom of the sea. *See* Ascidian; Tunicata.

Salpi. Lagoon of Italy, in Foggia. Separated from the Gulf of Manfredonia in the Adriatic Sea by a narrow strip of land, 22 m. E. of the city of Foggia, it is 10 m. long by 2 m. wide, and yields considerable quantities of salt. The village of Salpi is close to the site of the ancient Salapia.

Salpingitis. Inflammation of the Fallopian tube or channel which connects the uterus with the



Salonica, Greece. 1. The Arch of Galerius. 2. The White Tower. 3. An imposing view of the waterfront and harbour, the second largest port in south-east Europe

ovary. Gonorrhoea is a frequent cause. If occurring on both sides, the condition often results in sterility. See Fallopian Tubes.

Sal Prunella. Fused potassium nitrate, moulded into balls or flat cakes. The name is derived from a belief in Germany in the 16th cent. that the salt was a remedy for a plum-coloured quinsy.

Salsette. Island in Thana district, Bombay state, India. It is situated N. of Bombay Island, and with it forms a breakwater for Bombay harbour against the monsoon winds and storms. Connexion is maintained between the two islands by a causeway, a stone bridge, and rly. embankments. A range of low hills, rising to 1,500 ft., runs N. and S.; the coastal lowlands yield coconuts and rice. Near Thana, on the E. coast, the chief town, are rock caves with colossal statues of Buddha. Ruins of convents, churches, and villas are a reminder of the Portuguese occupation, which ended in 1739, when the Mahrattas conquered the island. To forestall a Portuguese expedition sent out in 1774 to retake it, the E. India Co. govt. of Bombay dispatched a force to take Thana, and by the treaty of Surat, March 6, 1775, the Mahrattas ceded Salsette to the company. Area, 153 sq. m. Pop. 251,147.

Salsify or **SALSAFY** (*Tragopogon porrifolius*). Biennial plant of the family Compositae. It has an



Salsify. Leaves and root

edible root, and is known generally as the vegetable oyster. It requires deeply dug soil, similar to that suitable for parsnips (*q.v.*), and a sunny, open position. The purple flowers are seen in May or June, and should be removed as soon as they appear, for the benefit of the root. The roots are ready for use

at the end of Oct., and throughout the winter, and may be preserved in the same way as parsnips. Salsify is raised from seed sown in spring, and thinned out. To get the best flavour, the roots should be parboiled, and then fried in slices, or grated.

Salso. River of Sicily, Italy. The longest river in the island, it rises in the Madonian Mts. in the prov. of Palermo, and flows S. across the prov. of Caltanissetta to reach the Mediterranean Sea at Licata on the S. coast. Its length is 70 m. Like the other rivers of Sicily, it has but a small volume of water and may dry up completely during the summer droughts.

Salsomaggiore. A city and watering-place of Italy, in the prov. of Parma. Situated on the foothills of the Apennines, 6 m. S.W. of Borgo San Donnino, 70 m. by rly. S.E. of Milan, it possesses saline and sulphur springs, and is in normal times visited by invalids from all parts of Europe. There are interesting excursions into the neighbouring mountains.

Salt (Lat. *sal* and various Teutonic forms, *e.g.* Ger. *salz*). In chemistry the word is applied to all compounds formed by reaction between an acid and a base—the metal of the base replacing the hydrogen of the acid (*see* Salts). Specifically the term has long been applied to sodium chloride which occurs naturally in enormous deposits in many parts of the world. Salt is soluble in water, 100 parts of water dissolving 36.5 parts of salt at 0°C. and 39.6 at 100°C. In sea water the salt content varies from 3.3 p.c. in the tropics to 2.9 p.c. in polar regions. Natural deposits occur in various geological strata, being generally lenticular in shape. They have invariably been formed by the evaporation of saline solutions, *e.g.* sea water, especially in shallow coastal lagoons subject to periodical flooding, where repeated evaporation would occur. The great Polish salt mines at Wieliczka have galleries running six miles in one direction and two miles in the other and contain virtually an underground city with more than 1,000 inhabitants. Salt-bearing strata are sometimes thousands of feet thick, the rock salt having flowed, as a result of irregular stresses.

In the U.K. the most important deposits are in Cheshire (Northwich), Worcs (Droitwich), Staffs, and Durham, those of Cheshire being the most valuable. Near Northwich the Romans made salt by the evaporation of brine in open pans, using a local brine spring. Salt had previously been obtained by allowing the liquid to trickle over faggots and collecting the incrustation formed. The production of salt by evaporation

in pans was practised by the Chinese from very early times, but when the Romans learned and first practised the art is not known. The mining of salt began in England about 1670, when the deposit under Marbury (Northwich) was discovered. Only one rock salt mine is now operated in England, at Winsford, Cheshire, and of the annual salt production of about 800,000 tons, only about 180,000 is rock salt.

In addition to the salt actually recovered, much is used in industry direct as brine. It is estimated that about 2½ million tons of salt are used in this way, so that the British production of salt is of the order of 3,000,000 tons a year.

METHODS OF PRODUCTION. The evaporation of sea water has been carried on since very early times in primitive fashion and is still used. Large quantities are so obtained in Portugal, Italy, Spain, and France. As the salts in sea water differ in solubility the composition of the deposit alters as evaporation proceeds. The process can therefore be scientifically controlled. Usually the crude salt from sea water contains about 15 p.c. impurities but purer grades are made, particularly in France.

Methods of mining used are similar to those in coal mining. The rock salt is blasted and then dug out, leaving pillars of the natural rock standing at intervals to act as supports for the roof. The salt so recovered is about 95 p.c. pure sodium chloride.

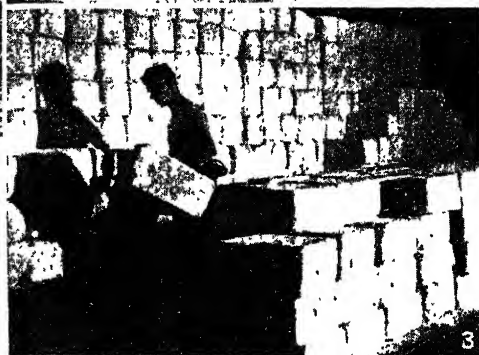
Various methods of evaporation of brine are used. The simplest is in open pans. The brine pumped from the workings requires no preliminary treatment, going direct to the pans. The fineness of grain of the product depends upon the temp. and rate of evaporation. The lower the temp. and correspondingly longer time, which may vary from 24 hours to six weeks, the coarser the product.

During evaporation the small quantities of calcium and magnesium salts present are precipitated as a scale adhering to the pan. This is removed and the salt obtained is therefore very pure. The magma of salt crystals can be moulded and subsequently dried in special chambers. For many purposes, however, it is sufficient to allow the salt to drain on the side of the pan and then remove it to sheds to dry naturally.

The finest grained salt is prepared by a vacuum pan process for which the brine has first to



Salt. 1. Working on the face of a rock salt deposit. 2. Making salt from brine by the open pan method. 3. Blocks of salt ready for crushing into domestic salt



be purified by precipitation of calcium and magnesium salts. The evaporator is a large cylindrical vessel with a conical bottom and containing vertical pipes through which the brine passes continuously. Steam is admitted on the outside of the pipes and thus a large surface of evaporation is provided. The evaporators are arranged in series. The steam passes through the series, being finally condensed and returned to the boiler. The precipitated salt falls to the conical bottom and is continuously removed as a thick magma. The salt is dried and packed and the brine returned to other evaporators. In this way a very fine, free running, and pure salt is obtained.

Salt is one of the most widely used and vitally important natural products. It is an essential ingredient in the diet of both human beings and animals and in agriculture is a constituent of many fertilisers. It is also used as a dressing for pasture land. In the heavy chemical industry it is the basic raw material for alkalis and for chlorine derivatives. It is also used in pigment and dyestuff manufacture. In the soap industry it is used for "salting out" the curd (*see Soap*). As a preservative it is widely used in foodstuffs such as bacon, fish, and butter; and in many industrial products such as hides and skins. *See Gabelle; Geology; Mineralogy; Sodium.*

Salt, SPIRIT OF. Name given by Glauber to crude hydrochloric acid (*q.v.*) which he first prepared by pouring oil of vitriol (sulphuric acid) on sea salt. It is yellowish in colour, owing to the presence of

impurities which fit it only for certain industrial and similar uses. "Killed" spirit was used as a soldering flux; it is prepared by dissolving scraps of metallic zinc in the strong acid, and is used after effervescence has ceased. It has generally given place as a flux to a solution of zinc chloride; but for soldering zinc itself a dilute form of spirit of salt is used. It is unsuitable for electrical work and other uses where corrosion of the soldered joints must be avoided. But acid fluxes, where suitable, have an important cleansing action which is useful. In the home, the spirit is used for cleansing dirty w.c. pans, being applied on a mop and washed off quickly with water. Here it is giving place to less corrosive commercial preparations.

Salt, Sir Titus (1803-76). British manufacturer. Born at Marley, Yorks, Sept. 20, 1803, he went to Bradford as an apprentice in the woollen trade. With his father he started in business in 1824, and with great inventive genius devised a method of using alpaca for the manufacture of cloth. The business of woollen and worsted manufacturers then grew so enormously that the town of Saltaire was erected for it just

outside Bradford. In 1859-61 Salt was Liberal M.P. for the latter. He was a prominent Congregationalist and a generous donor to charities of all kinds. Made a baronet in 1869, he died Dec. 29, 1876. His Life was written by R. Balgarnie, 1877.

Salta. Northernmost prov. of Argentina lying S. of Bolivia. Very mountainous in the W., rising to 20,000 ft., it also contains fertile valleys, woodland tracts, and pastures. It is watered by the rivers Vermejo, Salado, and Pasage, and holds extensive salt swamps, while to the E. it forms part of the Gran Chaco (*q.v.*). Minerals abound, chiefly gold, silver, and copper; there are also considerable oil deposits. Agriculture is the main industry, the principal crops being maize, alfalfa, sugar, grapes, coffee, tobacco, and fruit. Irrigation is necessary in many parts. Large herds of cattle are raised, and the prov. is noted for its ox-hides, which are exported in large quantities. Its area is 48,872 sq. m. Pop. 564,622.

Salta, the capital, stands at an altitude of over 4,000 ft., on the Salta river, an affluence of the



Salta arms



Sir Titus Salt

Salado, 145 m. N.W. of Tucuman. It has a cathedral, college, and high school, and its trade is chiefly with Bolivia. In 1948 a rly. was completed, linking Salta with the Chilean port of Antofagasta. Pop. est. 45,000.



Saltaire, Yorks. Congregational church
Frith

Saltaire. Village of the W.R. of Yorks, England. On the Aire, 4 m. N.W. of Bradford, it is served by rly. and by the Leeds and Liverpool canal. It owes its name and origin to Sir Titus Salt, who, in 1853, opened a factory here for the manufacture of alpaca. Sir Titus made Saltaire a "model village," and provided schools and a chapel. Saltaire is administratively part of the urban district of Shipley (*q.v.*).

Saltarello (Lat. *saltare*, to jump). A 16th century dance movement in triple time. It followed immediately upon another movement in common time such as a galliard, the two forming one dance. The saltarello was probably a round dance, while the first part, the galliard, was performed in the country dance manner, those taking part facing each other in two lines. Saltarello is also the name of a modern Italian dance of vigorous character for one or two persons. The music has a rhythm suggestive of leaping, whence the name.

Saltash. Mun. borough, Cornwall, England. It stands on the Tamar, 4 m. W. of Devonport, with a rly. station. The chief industry is fishing. The fine, lofty bridge across the Tamar is 2,240 ft. long, and was built by Isambard Brunel. Cattle markets are held. Saltash was an important place in the Middle Ages, and its fisheries

were valuable. Queen Elizabeth made it a corporate town, and it sent two members to parliament until 1832. The medieval corporation was re-formed in 1886. Market day, alternate Thurs. Pop. est. 7,000.

Saltilion (Lat. *saltatio*, leap). In geology, the movement by water or wind of particles too heavy to be carried in suspension, and too light merely to roll. The particles bounce and are carried forward only to drop, bounce and be swept along again. In this way grains and small pebbles get rounded, by having corners knocked off.

Saltburn-by-the-Sea. Urban dist. and watering-place of N. Riding of Yorks, England. On the E. coast, 16 m. E. of Middlesbrough; it has a rly. station. The prosperity of the place as a seaside resort dates from the opening of the rly. in 1861. Its attractions include bathing, golf links, and a pier, while there are fine cliffs and pleasure grounds. But the most notable feature is the magnificent stretch of sand which, starting here under the lee of the Huntcliff runs W. for 8 m. to the mouth of the Tees. Pop. 4,500.



Saltburn, Yorkshire. Bay, with the pier and cliffs

Salt Cellar. Receptacle for holding salt, placed upon the table at meals. Apart from the general use of salt, such were important because in the Middle Ages in large households a great salt cellar marked the division of the table into two parts; above it sat the guests of rank, and below it the inferiors, hence the phrase "below the salt."

Saltcoats. Police burgh and watering-place of Ayrshire, Scotland. It stands on the E. shore of the Firth of Clyde, 30 m. from Glasgow and one from Ardrossan, and is served by two branches of British rlys. It has become a popular watering-



Saltcoats
borough arms



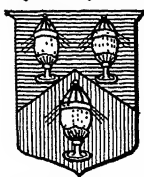
Saltash, Cornwall. Entrance to Brunel's famous railway bridge across the Tamar, connecting Saltash with Devonport

place, but its shipbuilding industry has declined. The name is due to the salt industry which flourished here about 1600-1800. Pop. 10,173.

Salter, Sir (James) Arthur (b. 1881). A British economist and politician. Born March 15, 1881, at Oxford, where he was educated at Brasenose College, he entered

the transport dept. at the Admiralty in 1904, and was director of ship requisitioning, 1917. An expert on distribution and supply, he was in charge of the economic and finance section of League of Nations at its inception and again 1922-31, going on missions to India, 1930, and China, 1931 and 1933. Sir Arthur was knighted in 1922. In 1932 he published *Recovery*, a celebrated book. During the Second Great War he held junior parliamentary offices and headed the British merchant shipping mission at Washington, 1941-43. In 1944 he was senior deputy director-general of U.N.R.R.A. Gladstone professor of political theory at Oxford, 1934-44, he was Ind. M.P. for Oxford University, 1937-50. In 1947 he became chairman of the advisory council of the international bank.

Salters' Company. London city livery company. Originating in a guild of Corpus Christi in All Hallows, Bread Street, it received its first licence as a fraternity and guild from Richard II, in 1394. Arms



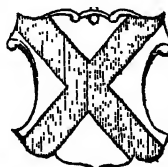
Salters' Co. arms were granted in 1530, and a charter of incorporation in 1559. The company participated in the colonisation of Londonderry in the time of James I. Its first hall, in Bread Street, a bequest by Thomas Beaumont in 1454, was burnt in 1539; the fifth, in St. Swithin's Lane, built 1823-27, was destroyed by German bombing from the air in 1941. The company administers almshouses at Watford and Maidenhead.

Saltito. Town of Mexico, capital of the state of Coahuila. It is 46 m. W. by S. of Monterey, and is served by rly. Its prominent buildings include the cathedral, Madero institute, and Athenaeum. Among industries are the manufacture of cotton and woollen goods, flour milling, etc. Pop. 75,721.

Salting, GEORGE (1835-1909). British art collector. Born at Sydney, N.S.W., Aug. 15, 1835, the son of a wealthy merchant of Dan-

ish origin, he was educated at Eton and Sydney university, and then studied art and archaeology in Rome. Settling in England, he passed his life in collecting Oriental porcelain, majolica, small statuary of every description, and pictures and drawings. He died Dec. 12, 1909, and by will divided his collection among the Victoria and Albert Museum, the British Museum, and the National Gallery.

Saltire. In heraldry, one of the ordinaries. A four-limbed figure, composed of two bands placed over



Saltire in heraldry

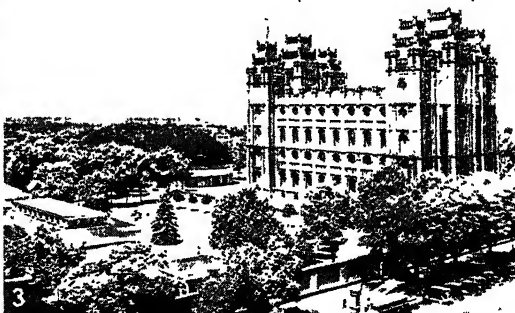
each other diagonally, it has been described by some heraldic writers as a park gate or barrier, by others as a house gable, but it is generally recognized as the cross of St. Andrew, or *crux decussata*. A shield may be divided "per saltire," and charges grouped "in saltire." See Heraldry, colour plate; Ordinary.

Salt Lake City. City of Utah, U.S.A. The state capital and the co. seat of Salt Lake co., it is 11 m. S.E. of Great Salt Lake, and is served by the Denver and Rio Grande and other rlys. It is the

eccles. capital of the state, and the headquarters of the Mormons or Latter-Day Saints. Among their buildings are the granite temple, 1853-93, and the tabernacle, which holds 8,000 persons. Other structures include the city and co. building, the federal building, and S. Mark's cathedral. Salt Lake City is the seat of the university of Utah, and has a state normal school, the Latter-Day Saints' university, and public and state law libraries. It is a planned city of broad streets and green lawns. Manufactures are boots and shoes, confectionery, tobacco, cigars, etc. There are large smelters, and extensive business in minerals and stock.

The city was founded in 1847 by Mormons (*q.v.*) under Brigham Young, and incorporated four years later. Deemed the capital of a rebellious state, it was occupied by U.S. troops 1858, but a truce was arranged. The arrival of the Pony Express (*q.v.*) and the rly. ended the isolation of this city. Pop. 149,934.

Salto. Dept. of N.W. Uruguay, fronting the Uruguay river. The surface is hilly, and is watered by numerous streams. The soil is fertile, producing a large quantity of fruit, from which wine is made. Its area is 4,865 sq. m. Pop. 100,840. Salto, the capital, stands on the Uruguay river, 260 m. N.W. of



Salt Lake City, Utah. 1. Main Street, the city's commercial centre, 132 ft. wide in accordance with Brigham Young's original plan. 2. Utah State Capitol. 3. Temple Square, showing the granite temple of the Mormons, or Latter-Day Saints, right; the squat Tabernacle, centre, and the Assembly Hall, left

Montevideo, with which it is connected by rly. Its port is used for the transshipment of goods from Buenos Aires and Montevideo to S. Brazil. Salto is often called the city of oranges, the groves covering 12,000 acres. Pop. 30,000.

Salt of Sorrel. Potassium quadroxalate ($\text{KHC}_2\text{O}_4 \cdot \text{H}_2\text{C}_2\text{O}_4 \cdot 2\text{H}_2\text{O}$). It is so called because it was first prepared from wood sorrel (*Oxalis acetosella*). It is now made by partially neutralising oxalic acid with potassium carbonate, and is also sold under the dangerous misnomer of salt of lemon, although lemons do not contain oxalic acid, which is poisonous.

Salt of Tartar. Potassium carbonate. It is so called because it was first prepared by the action of heat on tartar. It is the deposit which forms in casks during the fermentation of wine.

Salton. Name of two villages of East Lothian, Scotland, also known as Saltown and Saltoun. It is also the name of a stream which here unites with the Tyne. East Salton is 16 m. S.E. of Edinburgh and West Salton is about $\frac{1}{2}$ m. away. The place is noted for its connexion with Andrew Fletcher, who bought the estate. Under his patronage it became famous for its barley, while his nephew, Lord Milton, helped the British Linen Co. to start its first bleachfield here. The chief building is the parish church at E. Salton. Gilbert Burnet was at one time minister here.

Salton Sea or **SINK.** Lake of California, U.S.A. The Salton depression in S. California, N. of the Gulf of California, is 260 ft. below sea level in its most depressed portion, and lies between the San Bernardino and Chocolate Mts. and the Superstition Mts. In 1905-07, during the operations incidental to the construction of the All America irrigation canal from Yuma, Arizona, on the Colorado river through Imperial Valley, water flooded 400 sq. m. of the basin and formed the sea, now c. 200 sq. m. in area.

Saltoun, Baron. Scottish title now borne by the family of Fraser. The first baron was Sir Lawrence Abernethy (cr. 1445), and his family held it until the 9th baron died in 1668. It then passed to a descendant of the 7th baron. His daughter had married Alexander Fraser of Philorth, and in 1670 the title was confirmed to their son Alexander, who became the 10th baron. It has been borne by his descendants ever since, Alexander Arthur (b. March 8, 1886) becoming the 19th baron in 1933. The

family seat is Cairnbulg Castle, Fraserburgh.

Saltpetre (Lat. *sal*, salt; Gr. *petra*, rock). Potassium nitrate or nitre, KNO_3 . It is a colourless solid, with a bitter, salty taste, and is found as a superficial deposit on the soil of many hot, arid climates. The name is also given to Chile saltpetre, or sodium nitrate, NaNO_3 , and calcium nitrate wall or lime saltpetre, $\text{Ca}(\text{NO}_3)_2$. In pharmacy, potassium nitrate is known as *sal prunella*.

Extensive deposits occur in Chile, where it is found associated with nitratine (see Nitrates.) Ordinary saltpetre is also found in superficial deposits in parts of Europe and N. America; but is largely produced in India by lixiviation of the saline earth. Common saltpetre is a powerful oxidising agent and is used in metallurgy, in the making of gunpowder, as a brine in salting meat, in the treatment of asthma, etc.

Chile saltpetre is found in deposits spread over a large area in S. America, and known locally as *caliche* (g.v.). Also known as cubic saltpetre from the shape of its crystals, it is largely used in the manufacture of ordinary saltpetre, nitric acid products, as a fertiliser, etc.

Wall or lime saltpetre is manufactured by fixation of nitrogen from the air, and absorbing the nitric acid so formed by lime. It is a fertiliser. See Potassium.

Salt Range. Hilly tract of the W. Punjab, Pakistan. It lies between the Jhelum and the Indus, and is a W. extension of the Siwalik Hills, culminating at its W. end in Sakesar, 5,000 ft., where local officials have established hot-weather headquarters. The great deposits of rock salt are at Kheora. The hills are bare, but shelter populous and fertile valleys. The range is of great geological interest; the rock salt occurs in strata of Cambrian age; resting unconformably upon the Cambrian strata are Carboniferous rocks containing a glacial boulder-bed. At the other end of the range are fossiliferous Tertiary strata, including nummulitic limestones associated with coal.

Salts. In chemistry, substances derived from the reaction of an acid on an alkali in certain definite proportions. As an example, if to a quantity of sulphuric acid is added sodium hydroxide until the acid is neutralised, the resulting liquid when evaporated yields a substance exhibiting neither the properties of the acid nor those of the alkali. This is the salt known

as sodium sulphate. There are other methods of making salts, e.g. dissolving a metal in sulphuric acid, or dissolving a basic hydroxide or oxide in an acid. When a metal, e.g. zinc, dissolves in sulphuric acid, the hydrogen of the acid is replaced by the metal, so that salts may be considered as acids in which the hydrogen has been replaced by a metal.

The varieties of salts are as follows:

Neutral or normal salts, as the name implies, are neutral to litmus, or the whole of the hydrogen of the acid has been replaced by the alkali, e.g. Na_2SO_4 (sodium sulphate). Acid or acidic salts are those in which only part of the hydrogen has been replaced, e.g. K H SO_4 , acid sulphate of potassium. Basic salts contain a higher proportion of a base than is necessary for the formation of a normal salt, e.g. $\text{Bi}(\text{OH})_2 \text{NO}_3$, basic bismuth nitrate. Double salts are those which in their formula show two complete salts, e.g. iron ammonium sulphate.

In mixed salts half the acid is neutralised with one base and half with another, e.g. tartrate of sodium and potassium or Rochelle salt. Complex salts are formed in some reactions by mixing two or more single salts in solution, but they differ from double salts in having the composition of a single salt, e.g. potassium ferrocyanide. Hydroxy-salts contain hydrogen and oxygen in the proportion to form water. When this water is separated an oxy-salt results. Pyro-salts are salts in which water has been driven off by means of heat. See Acid; Alkali; Chemistry; Solution.

Saltwood. Village of Kent, England. It overlooks the sea near Hythe, and is noted for the ruins of its castle. This was a residence of the archbishop of Canterbury, and from here the knights set out to murder Becket. Tradition says it was founded by Hengist. There is an old church, SS. Peter and Paul.

Saltwort (*Salsola kali*). Annual herb belonging to the family Chenopodiaceae. It is a native of Europe, Asia, Africa, Australia, N. and S. America. It has a prostrate, many-branched stem and fleshy, awl-shaped leaves. The small, greenish flowers are without petals, and are produced at the base of the leaves. Saltwort grows on sea-shores, and was formerly important as the source of barilla, an impure carbonate of soda, still used in the production of glass

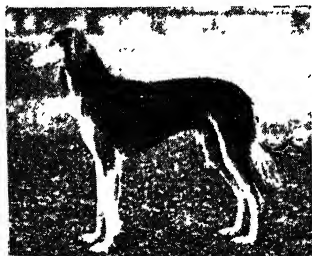
and soap. To obtain this the plants are dried and burnt on a grating over a pit, into which the fluid barilla drops. The name is sometimes applied also to the marsh samphire or glasswort (*Salicornia europaea*), also a member of Chenopodiaceae, which is used for a similar purpose.



Saltwort. Leaves and flowers of the sea-shore plant

Saluda. River, co., and town of S. Carolina, U.S.A. The river rises in the Blue Ridge and flows, in general, S.E. for 200 m. to unite with the Broad river and form the Congaree river. The small town, which lies 12 m. N. of Johnston, is the county seat. Here was started a famous system of libraries for negroes. The co. has an undulating surface, drained mainly by the river.

Saluki. Breed of dog. Believed to be the oldest representative of the greyhound family, it was the coursing dog of the Arabs, and widely distributed throughout the Middle East, especially Persia. Dogs bred in Great Britain are of milder temperament than imported ones, many of which are savage. They should have a long, narrow head; the ears should be long and drooping, and covered with long, silky hair. Salukis are



Saluki. A champion of this breed of dog, oldest representative of the greyhound family

white, cream, red, fawn, golden, grizzle and tan, black and tan, or three-coloured.

Salus. In Roman mythology, the goddess of health and prosperity, public and private. The Romans identified her with the Greek goddess Hygieia.

Salut, ÎLES DU (Fr., Safety Islands). Group of three islands off the coast of French Guiana, to which they belong. They rise from 100 ft. to 200 ft. alt. The headquarters are on Île Royale, which is nearest the mainland; this is a coaling station, and has

a large hospital. Formerly it was a convict settlement. Next is the Île de St. Joseph, and beyond it is the Île du Diable.

Salutation (Lat. *salutatio*, from *salus*, wish for welfare). Form of address and gesture used on ceremonial occasions, and in social

intereourse, to express worship, submission, respect, or affection. Among oral salutations may be mentioned the Oriental "Peace be on thee," "The Lord be with thee"; the old Babylonian formula "O king, live for ever," cf. the Irish "Long life to your honour"; the Greek *χαίρε* (Be joyful), used for both greeting and parting; and the Roman *Salve* and *Vale* (Be well), used respectively at meeting and parting; the modern English, "How do you do?"; "Good-bye," with its religious origin, "God be with you," cf. the French *Adieu* and the Spanish *Vaya usted con Dios* (Go with God).

The origin of the almost universal and ancient custom of saluting after sneezing is unknown. Salutations by gesture include prostrations, ranging from the profound obeisances of ancient Egypt and the East generally to the modern European nod or almost imperceptible bow. In China ceremonial bowing and kneeling are regulated by a rigid etiquette. In Christian religious ceremony, worshippers bow before the Host and at the name of Jesus. In Europe in the Middle Ages, kneeling on both knees was reserved for divine worship, or one for homage to the sovereign. In England the curtsy is retained in court ceremonial, and lingered in the form of a "bob" until the 20th century in country districts.

The grasping of hands in token of a compact—as seen in the Roman and later in the Christian marriage ceremony—and the early Christian "right hand of fellowship" grew into the modern handshake. The Chinese shakes hands with himself. Secret societies have their own handshakes, by which initiates may make themselves known to each other.

Uncovering or disrobing as a form of salutation varies in degree in different countries—from the baring of the head by men in the West and of the feet in Burma and

elsewhere in the East, to the stripping to the waist in Polynesia, and the total stripping in some parts of Africa. See *Kissing*.

Salute. In the army and navy, the paying of a compliment or showing respect. Compliments are paid on the approach of royal or other distinguished personages, commissioned officers of superior rank, when bodies of troops or ships meet, at the burial of officers or rank and file, and on other ceremonial occasions. The form of salute varies according to the occasions and the persons to whom the compliment is being paid. An unarmed soldier or sailor meeting an officer, and an officer meeting a senior of, or above, field or equivalent rank, salute by raising the right hand smartly to the forehead. A soldier carrying his rifle slung salutes by extending his arm to the butt and turning his head to left or right. A sentry with his rifle at the slope salutes by placing his right arm across his body with his right hand on the butt; officers of field rank and bodies of armed troops are saluted by presenting arms. The royal salute to the sovereign consists in the band playing the national anthem, the presenting of arms, and the lowering of colours. Uncased colours are saluted by troops at all times.

In the R.N., boats' crews salute by tossing the oars, lying on the oars for a captain, and, with a powered boat, stopping for the sovereign. Other naval salutes are the firing of guns, the number of rounds fired depending on the rank of the recipient, dipping flags, and manning ship. Indian princes are entitled to salutes of guns according to their status.

Saluzzo. City of Italy, in the prov. of Cuneo. It stands on an affluent of the Po, at the E. base of the Cottian Alps, 42 m. S. of Turin. The old part of the town is built on a hill at an alt. of 1,200 ft. It retains part of its old fortifications and the castle, now utilised as a prison. The lower part of the town contains the handsome cathedral (modernised), which dates from 1480. There are also abbey ruins. The 16th century Casa Casazza houses a well-stocked museum. Silvio Pellico and Bodoni, the painter, were natives of the city. Manufactures include silk, hardware, leather, and hats. The capital of a marquiseate from medieval times down to about 1550, Saluzzo was seized by the French, who in 1601 handed it over to Savoy. Pop. 16,170.

Salvador, El. Republic of Central America, area 13,173 sq. m., bounded on N. and E. by Honduras; W. and



Salvador Republic arms

N.W. by Guatemala; S. by the Pacific. The coastline is about 160 m. long, with three main ports of Acajutla, La Libertad, and La Unión. San Salvador, the capital, is 2,000 ft. above sea level and 23 m. from its port, La Libertad, to which there is a modern asphalt motor road. It is also connected by rail or road with the main cities of El Salvador and with the international railroad of Central America.

The extensive inland plateau has several active volcanoes. The Izalco is the most active in Central America and its flames make a well known landmark to mariners on the Pacific. Between two mountain chains which cross the country lie valleys of great fertility, e.g. the valley of Lempa, 2,000 ft. above sea level, comprising most of the area of the country and watered by the Rio Lempa. In the cones of some extinct volcanoes lie beautiful lakes, sometimes used as landing places for seaplanes.

The main crop is coffee, planted intensively on the mountain slopes, the plantations often extending to the summits of hills and volcanoes and covering altogether about 265,000 acres. Coffee constitutes 80 p.c. of the country's exports. Crops, if destroyed by volcanic dust from eruptions, grow again with renewed vigour. Sugar, corn, beans, and wheat are among other crops. El Salvador is the sole producer of balsam of Peru, a healing drug, misnamed in early Spanish times, when Peru was the better known country. The production of henequen or sisal fibre has greatly increased in the 20th century. Gold, silver, copper, and mercury occur, but there is only one important gold mine. The country has luxuriant forests, which have been little exploited.

Conquered by Pedro de Alvarado in 1524 and freed from Spanish control in 1821, the history of El Salvador is chequered by many revolutions and wars. In 1939 a new constitution was adopted, but in 1945 the old constitution of 1886 was reinstated. There is only one legislative body, the national assembly with three deputies from each department, elected by vote for one-year terms. There is universal suffrage, the vote being con-

ceded to women in 1945. The executive is the president, in whom large powers are vested. He is elected by direct popular vote for a four-year term. Military service is compulsory between the ages of 18 and 50. Education is free and compulsory. The language is Spanish, and the dominant religion is Roman Catholic. The colon is the monetary unit with a fixed exchange value (2.5 colóns=\$1). The climate is almost temperate on the tableland, but the lowland is often hot. There is a wet season, with wind and thunderstorms, from May to October, but the rest of the year is usually dry and warm.

The population is about two million, of whom about 10 p.c. are Spanish; 50 p.c. mixed Spanish and Indian; and 40 p.c. Indian. The majority live on farms, but the government aspires to convert



Salvador flag. Blue, white, and blue

El Salvador into an industrialised country; and its density of population, the character of the people, and its geographical location seem to fit it for this.

Salvador DA HORTA (1527-67). Spanish saint. Son of a poor, pious family of Catalan stock, he was born near Gerona, and after working as a shoemaker in Barcelona, became a Franciscan monk, in the same diocese. He was venerated for his supernatural gifts. He was canonised April 17, 1938.

Salvage (Lat. *salvus*, safe). Term applied to the saving of any property from total loss or destruction by retrieving it for re-use in its original form, or retrieving its component materials for conversion to other uses. Used almost exclusively at one time in connexion with the raising of marine wrecks or abandoned vessels, the term has become more widely extended in meaning to cover the recovery of almost every kind of re-usable material.

From crude beginnings limited by the mechanical devices of the period, marine salvage has developed into a highly technical process demanding an expert knowledge of seamanship, naval architecture, and general engineering principles and practice. This knowledge has to be applied in the recovery of the vessel from the position where it has been wrecked, sunk, or disabled; in transporting it when raised to a place of safety; and in carrying out repairs, or in breaking it up if it is beyond economical repair.

A ship, even if not totally immersed, may present a most serious problem in salvage. Frequently a simple stranding of a vessel on a sand bank at high spring tide (when no structural damage directly results) can bring about a total loss as the ebb and flow of succeeding tides tend to break the vessel in two by the sheer weight of her unsupported fore and aft structure. A vessel so situated is cut in two, water-tight bulkheads are made good, each half is

pumped out, and, when tides are suitable, the portions are towed separately to the repair port where, often, the two halves are skillfully rejoined.

Comparatively small vessels submerged in water that is not very deep can be raised by passing wire hawsers under the hull. This can be done by "feel" on sandy or mud bottoms, but divers must be employed, if the sea bed is rocky and irregular. At greater depths the hawsers are placed in position by mechanical



Salvage. A diver descending with oxy-acetylene cutting gear to work on a half-submerged wreck

devices. A dozen or more hawsers form a cradle which is made fast to tank lighters on each side of the vessel to be raised. These lighters are then sunk by admitting water into the tanks; the cradle is shortened and made fast, the water is pumped out of the tanks which rise buoyantly to the surface with the weight of the wreck supported in the cradle. Lighters and suspended wreck can then be towed to a place of safety. Often this procedure must be repeated a number of times to shorten the cradle support as shallower water is reached.

Pontoons or tanks are sometimes attached direct to the hull of a small wrecked vessel, and pumped out, raising the wreck with, as it were, a life-belt around her.

The enormous weights involved in salvaging big vessels preclude the use of hawsers and attached at tanks. The hull of the vessel is made comparatively water and air tight by welding patches to damaged plates and sealing all openings. Compressed air is then pumped into the vessel to force out the water and bring her to the surface. Much of the super-structure is removed before floating the hull. This system was made practicable through the development of underwater welding and cutting by salvage operators in diving equipment.

In the U.K. the ministry of Supply allocates the tonnage available to the three or four firms equipped for large-scale shipbreaking. Merchant ships, passenger ships, warships, and all kinds of smaller craft are broken down to the last smallest scrap. Iron and steel is identified metallurgically, cut to furnace size, and sent to blast furnaces; non-ferrous metals such as lead, copper, brass, gun-metal, and bronze are sorted, graded into categories, and made suitable for remelting. Timber and fittings, and every item of plant or equipment that can be reconditioned are salvaged and repaired for renewed service.

Until oxy-acetylene flame cutting apparatus became available to the shipbreaker his tools were shears, a winch, a hammer and chisel. On the other hand, the hulls with which he had to deal were less robust. Cutting gases are piped along the quays and aboard the ships to be broken up; blasting pits deal with heavy forgings such as propeller shafts; magnet cranes move heavy sections as they are cut from the ship to the quay, where they are cut down pro-

gressively to furnace size. Since scrap metal salvaged from ships returns to the steel works for re-conversion, the safety razor blade may well contain steel that once formed part of a naval ship or of a rusty tramp steamer.

SALVAGE AT SEA. A person who renders salvage service which saves a vessel, her cargo, or the lives of those on board from danger at sea is entitled to a reward for his services so long as they are given voluntarily and not in performance of any legal or official duty. Before salvage award can be claimed, the services must have been successful. There may be an agreement on the sum to be paid for salvage services, but in the absence of such agreement the amount is fixed by the court. As a general rule it will not exceed half the value of the property saved. In the U.K. salvage matters come before the Admiralty division of the high court.

SALVAGE OF WASTE. Under the Hitler regime, salvage of domestic and other waste materials which could be turned to fresh use was enforced in Germany; and in the U.K. the increasing call on shipping space during the Second Great War led to the development of salvage schemes, and to the introduction of orders under the defence regulations making it an offence to destroy or throw away e.g. paper, string, metal, rubber, foodstuffs. In June, 1940, local authorities were required to organize waste collections, while such bodies as the W.V.S. and the Boy Scouts instituted voluntary collections of salvage. From all sources, 1,946,971 tons of waste paper, 8,000,000 tons of domestic salvage, 65,597 tons of bones, 1,500,000 tons of scrap metal, and 125,242 tons of rags and textiles were collected during the war years. Total value of these materials exceeded £45,000,000; more than 130,000 voluntary collectors assisted in its collection. The collection of salvage was continued after the war.

Salvage Corps. Organization maintained at the expense of an insurance co. for salving property damaged or endangered at fires. Calls to fires are passed to the corps by the fire service, with which close cooperation is maintained. Salvage tenders with necessary appliances and equipment are dispatched immediately,

and, while the firemen are at work extinguishing the fire, salvagemen enter the premises to protect property as far as possible from damage by water, smoke, and heat. Goods are covered by waterproof sheets, machinery is oiled, water pumped from basements, and roofs temporarily repaired.

The London Salvage Corps was established in 1866, after



Salvage Corps. Uniform of the London salvage men

responsibility for fire brigadework (previously undertaken by insurance companies) was transferred to the municipality. It has three stations, the h.q. being at 63-66, Watling Street, E.C.4, a chief officer, and a staff of 60-70 men. The equipment includes nine motor tenders, three portable pumps, approx. 1,000 waterproof covers, and miscellaneous plant. The number of

fires attended each year in London is about 2,000. Similar organizations are maintained in Liverpool and Glasgow.

Salvarsan (late Lat. *salvare*, to save; *sanitas*, health). German trade name given to arsenphenamine, called also 606 because that was the number of the successful experiment, made in 1907, in a long series conducted by Ehrlich and Hata in their search for a remedy for syphilis. It is a yellow powder, soluble in water, and its discovery was the first practical demonstration of chemotherapy. It has been largely replaced by neosalvarsan (*g.v.*), and the term 606 now describes sodium salvarsan, a further improvement.

Salvatierra. Town of Mexico, in the state of Guanajuato. It stands on the river Lerma, 17 m. S. of Celaya, and is served by the national rlys. of Mexico. It has cotton and other industries, and was founded in 1613. Pop. 12,000.

Salvation. In a religious sense, the deliverance from original sin, the attainment of holiness, and, finally, immortal life, the reward of believers through the life, death, and resurrection of Jesus Christ. See Redemption.



London Salvage Corps badge

THE SALVATION ARMY AND ITS WORK

Col. Robert Sandall, Author, *History of the Salvation Army*

An account of the revivalist mission which, under William Booth's inspired leadership, developed into a world-wide religious and reforming force. See also biographies of the generals of the army

The Salvation Army is a religious, social service, and social reform organization that originated in the E. of London in the 1860s. Its work is based upon a twofold conception: (1) that human failure and sinfulness can be remedied only by divine action as seen in the spiritual regeneration



Salvation Army badge

known as conversion; (2) that it is obligatory upon all Christians to serve others, as revealed in our Lord's commendations of those who in doing so had served Him (Matthew 25, vv. 40-45). On July 2, 1865, in a tent in a disused Quakers' burial ground in Thomas Street, Whitechapel, in place of an evangelist who had been taken ill, William Booth (*q.v.*) began what was intended to be a week's revival services. The tent was one of a number of religious endeavours set on foot by the E. London special services committee formed in 1861 as an outcome of the 1859 religious revival. The workers at the tent invited William Booth to stay, and he, with the agreement of his wife Catherine, having come to the conclusion that he had there found his destiny, agreed.

The E. London Christian Mission

A number of these workers, together with converts made during William Booth's first meetings, were formed by him into the Christian revival association, later renamed the E. London Christian mission. In 1870, the mission having been extended outside London, the limiting prefix was dropped. In this year Booth set up the Christian mission conference, transferring to that body all his own powers. In 1875 a deed poll embodying full provisions for self-government was enrolled in chancery, but before two years had passed a deputation of the most ardent leaders of the mission waited on Booth, pointed out that government by conference and committee was becoming too cumbersome, and besought him to re-assume full responsibility. He agreed, and the conference (June, 1877) unanimously ratified the change. The next and last con-

ference (Aug., 1878), annulled the 1875 deed poll and replaced it by a new deed, the principal provision of which was that the E. London Christian mission should be always thereafter under the oversight, direction, and control of some one person.

In May, 1878, the name Salvation Army was written into a leaflet by Booth as explanatory of the nature of the Christian mission. By the end of the year it had been universally adopted and the former name was thereupon dropped for good.

The first move outside the U.K. was made in 1880 when Commissioner George S. Railton was sent to the U.S.A. to organize work in Philadelphia begun by a family of Salvationists (Shirley) who had emigrated from Coventry.



Salvation Army uniforms, 1948

The reform side of the Army's service was begun in the early 1880s by individual women Salvationists in many parts of the U.K. who took into their own homes girls who desired to "leave the streets." It was first established on a permanent official basis by the opening of a rescue home in Melbourne, Australia, in Jan., 1884; a small home was opened in Whitechapel, London, in the following May. Efforts to aid men who had been in prison began in Australia in 1885.

The missionary field was first entered in India (1882) by F. St. George de L. Booth Tucker, who gave up a commissionership in the Indian civil service. Native costume and the native way of life were adopted. By 1947 there were in India, Pakistan, and Ceylon 3,641 officers (most of them native) and 6,836 centres of work, which included schools, hospitals, dis-

pensaries, and leper colonies. An outstanding feature of Indian service was the gathering into settlements and setting to work of criminal tribes (dacoits and outlaws). For this Salvation Army officers were awarded the Kaiser-i-Hind gold medal.

The Salvation Army is worldwide; its officers preach in 102 languages. It publishes 111 periodicals with an aggregate circulation of one and three-quarter million copies per issue. Everywhere it is one Salvation Army, and its members and officers of all nations are of equal standing.

Its full-time officers number 32,000; another 15,205 persons without rank are also fully employed. Local officers (part time voluntary workers) number 102,400. More than fifty thousand bandmen and bandswomen give unpaid service (instruments and music only are provided; they buy their own uniforms). Evangelistic work is carried on at 18,000 corps and outposts.

In 1881 the international h.q. of the Salvation Army was moved from Whitechapel Road to a building at 101, Queen Victoria Street, E.C.4, which was burnt down in 1941 during a German air raid. An international training college (at Clapton, 1882) is now housed at Denmark Hill, London. Training colleges have also been established in every country occupied. Beginning with the South African War, 1899, whenever troops have been in the field Salvation Army welfare workers have served with them; also Salvation Army chaplains. The annual self-denial appeal, which is everywhere observed, is the basis of the financial help on which the Army depends for such of its work as is not self-supporting.

Violent Opposition

The great expansion of the Salvation Army during the early 1880s aroused bitter opposition. When it was making converts from drunkenness by the thousand, many of the then existing poor type of beer shops were forced into bankruptcy. Bands of roughs were organized into "skeleton armies," plied with drink, and set to attack Salvationists. Opposition was also organized by vested interests of a still more vicious character, and the police and magistracy at first found it easier to suppress the victims rather than their attackers. Judgements by the Queen's Bench eventually established the Salvationists' right to go in procession; and to protection when

exercising that right; but before that hundreds of Salvationists were injured—some indeed to the death—and many suffered imprisonment.

The publication in 1890 of *In Darkest England and the Way Out* by General Booth marked the beginning of a change in the general attitude to the depressed and criminal sections of the population (the so-called submerged tenth). All the methods Booth proposed for their relief and reclamation, with the exception of the suggested colony overseas, have been put into effect, with many developments not in the original plan. The *Darkest England* trust deed, signed by William Booth in 1891, provides that monies given for this scheme shall be kept entirely separate from other Salvation Army accounts. In many countries the Army is an officially recognized agency for putting into effect legislation for the protection and care of young people; in the U.K., for instance, it has established approved schools.

In the U.K. the Army maintains district nurses and clinics, and Eventide Homes for the aged, and has helped to procure legislative reform when social and non-party in character, e.g. the Criminal Law Amendment Act of 1885, the Children Act of 1908, and various temperance enactments. In Japan, at the cost of severe handling by mobs, the Army pioneers brought about a fundamental change in social law which resulted in the immediate release of 12,000 young women from "white slavery."

The Army's Red Shield canteens served the armed forces at home and on the battlefield, and succoured the civilian victims of German bombing, in the Second Great War. Its welfare workers visit the blind and afflicted in their own homes and take them on holiday excursions.

When General William Booth died in 1912, Bramwell Booth, chief of the staff to his father since 1880, succeeded to the office of general. He was judged unfit for office, for health reasons, by the Salvation Army high council in 1929, and Edward J. Higgins was elected in his place. Every office in the Salvation Army is open to women. From 1934 to 1939 its International Leader was General Evangeline Booth, fourth daughter of William Booth. Albert Orsborn, C.B.E. (Mrs. Orsborn is a daughter of the late General Higgins), was elected general in 1946, on the retirement of General Carpenter.

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Salva y Perez, VICENTE (1784-1851). Spanish philologist. Born and educated at Valencia, he became professor of Greek at the university of Alcalá de Henares about 1804, but was compelled by the French invasion in 1808 to retire to his native town. Elected to parliament, 1820, he became a marked man owing to his Liberal principles, and withdrew in 1823 to London, where he became a bookseller. Removing to Paris, he published Spanish classics and works of his own, including a *Grammar of the Spanish Language*. 1830. Freed from fear of arrest by an amnesty, 1835, he returned to Spain, and again became a deputy and secretary to the cortes.

Salve Regina (Lat., Hail, O Queen). Antiphon said, or sung, in the R.C. Church, after lauds and compline, from Trinity Sunday to Advent. The earliest antiphon is addressed to the Blessed Virgin Mary, and placed in the Roman Breviary by Pius V, its composition is attributed to an 11th century Benedictine monk, Hermannus Contractus. The closing words, *O clemens, O pia, O dulcis, Virgo Maria*, are said to have been added by S. Bernard.

Salvia. Genus of plants of the family Labiatae, including the aromatic garden sage (*q.v.*). The genus has many showy species which are much cultivated in greenhouses and flower gardens. Some favourites are the brilliant scarlet *Salvia splendens*, a half-hardy species; *S. patens*, a beautiful blue; *S. pratensis*, purple; and the pineapple-scented *S. rutilans*, a scarlet greenhouse species.

Salvini, TOMMASO (1829-1915). Italian actor. He was born at Milan, Jan. 1, 1829, and first attracted attention in Rome in 1847 by playing Orestes to Adelaide Ristori's *Electra* in Alfieri's *Orestes*. His greatest part was Othello, which he first

played at Vicenza in 1856. Other great rôles were Hamlet, Romeo, Macbeth, King Lear, Conrad in Giacometti's *La Morte Civile*, Oedipus in Nicolini's play of that name, Paolo in Pellico's *Francesca da Rimini*, and the title-rôle in Alfieri's *Saul*. Died Dec. 31, 1915.

Salvo. Controlled fire of artillery in consecutive discharge by batteries. In battleships salvos are fired by each turret in turn.

Sal Volatile OR AROMATIC SPIRIT OF AMMONIA. Alcoholic solution containing ammonium carbonate and ammonium hydroxide, with small amounts of oil of nutmeg and oil of lemon. It is used as a stimulant in cases of fainting. *Pron.* sal volatilee.

Salween (Chinese *Lu-kiang*). River of China and Burma, rising in the Tibetan plateau and entering the Gulf of Martaban near Moulmein. It is navigable only for a stretch of about 100 m. at its mouth, a steamer service running between Moulmein and Shwegoon. After entering Burma from China the Salween flows directly S. It is a fast running river with incomparable scenery of forests, crags, and waterfalls. Its tributaries include the Gyaing and Attaran. From the Karenni country it forms the boundary between Burma and Siam for some 80 m. It is 1,750 m. long.

During the Second Great War the Japanese occupied Moulmein, from which the British had withdrawn, Jan. 31, 1942. By Feb. 2 they were in possession of Kadu I. in the estuary of the Salween, between Moulmein and Martaban. They occupied Martaban, on the W. bank, after heavy fighting on Feb. 10. Fighting continued E. of the river some 30 m. to the N. in the Paan area until by Feb. 15 the British had been forced back to the Bilin river.

The Burma Road crosses the upper Salween E. of Tengyueh, and in this area there was severe fighting between the Japanese, attempting to advance across the Salween from occupied Burma, and the Chinese in May-June, 1942, Dec., 1942, Feb., 1943, and Oct.-Nov., 1943. In May, 1944, on the nights of the 10th and 12th, a U.S. armed and trained Chinese army of 20,000 under Marshal Wei Li-Huang crossed the Salween, swollen with the melting snows of Tibet, on a 130-m. front N. and S. of the Burma Road to meet Stilwell's forces advancing through N. Burma.

Salwick. Village of Lancs, England. It is about 6 m. N.W.



Tommaso Salvini,
Italian actor

of Preston, with a rly. station on the Preston-Fleetwood line. During the Second Great War a chemical defence factory was established here which later became one of the factories concerned with the development of atomic energy for industrial purposes.

Salzach. River of Austria. It rises in the Hohe Tauern, a branch of the E. Alps, flows first E. in a long, narrow valley, and then N. to join the Inn at Braunau after a course of 130 m. In its lower section it forms the boundary between Austria and Bavaria.

Salzbrunn (Pol. Szezawno). Village of Silesia, under Polish administration since 1945. It lies along the valley of the Salzbach, 40 m. S.W. of Wroclaw, and was famous for its saline springs, the waters being used for pulmonary complaints, dyspepsia, gout, and rheumatism. Pop. (1935) 9,571.

Salzburg. Former duchy of Austria, now a province. The duchy had an area of 2,760 sq. m. It originated in the lands ruled by the archbishop of Salzburg, and until 1802 was an important German state. At the settlement of 1815, although somewhat smaller in extent, it became an Austrian duchy. In 1849 it was made a crownland. Salzburg was the capital; other towns were Hallein and S. Johann. The duchy, which was divided into six departments, had its own diet and sent members to the Reichsrat in Vienna. It is a mountainous and beautiful region, with agriculture as the staple industry, although there is some mining. In the district are a number of mineral springs, those at Gastein being the best known. Pop. 330,704. After the Second Great War the district of Salzburg was in the U.S. zone of occupation in Austria.

Salzburg. City of Austria. The capital of the prov. of Salzburg, it stands on the Salzach, 156 m. W.

by S. of Vienna.

The picturesque old town, which stands at a height of 1,400 ft., is on the left bank and is overlooked by the citadel of Hohen-Salzburg, on the top of the



Salzburg arms

Monchsberg. The chief building is the cathedral, a model of that of S. Peter's at Rome, put up in the 17th century by Santino Solari on the site of a building dating from 774. There are also the Franciscan church of the 13th century, those of S. Sebastian with the



tomb of Paracelsus, S. Peter, a Romanesque basilica of the 12th century, and a number of others. The palace was long a residence of the Hapsburg family, and there is another for the archbishop. The Mirabell palace, once another archiepiscopal residence, is now public property. The Benedictine abbey of S. Peter and the Capuchin monastery are two of several religious houses. There are modern government buildings, a medieval town hall, the old house in which the diet met, and museums. In the new town is the Gothic church of S. Andrew. The Neutor is a tunnel, cut in the Monchsberg, to connect the old town with one of its suburbs.

Mozart was born here, and his memory was perpetuated by a museum and a statue in the Mozartplatz. Salzburg was founded about 700 on the ruins of the Roman Juvavia, and developed because it was the seat of an archbishop who became one of the most powerful German prelates. It was a fortified town, its walls remaining until 1861. From 1623 to 1810, and again from 1928, it was the seat of a R.C. university. Near the city are the palace of Hellbrunn with its noted mechanical theatre, the castle of Aigen, and a number of beauty spots. An annual summer music festival was inaugurated in 1920,



Salzburg, Austria. The river Salzach with the old town on its left bank. Top, the fortress palace of Hohen-Salzburg

a festival opera house being built 1926. Salzburg surrendered without a fight to units of the U.S. 7th army, May 4, 1945, and was in the U.S. occupation zone. Pop. 106,919.

Salzkammergut. Dist. of the E. Alps in Austria. It extends E. from Salzburg into the prov. of Upper Austria and Styria. It is famous for its scenery, which owes much of its charm to the lakes, of which the chief are Traun, Hallstatt, Atter or Kammer, and Mond. Here are numerous popular resorts—Ischl, Gmunden, Traun-Kirchen, and Hallstatt. The Traun is the chief river. Salt is mined in large quantities, mainly at Ischl.

Samain, ALBERT VICTOR (1858–1900). French poet. He was born at Lille, April 3, 1858, and obtained municipal employment in Paris, 1881. He was one of the founders of the *Mercur de France*, 1890, and published a volume of poems, *Au Jardin de l'Infante*, 1893, which showed his great gifts as a writer of musical and sensitive poetry. It was awarded the *Prix Archon-Despérouses* by the Acad-

émie Française, and was followed by *Aux Plancs du Vase*, 1898, and *Le Chariot d'Or*, 1901. After a long illness he died at Magny-les-Hameaux, Aug. 18, 1900. A volume of *Contes* appeared posthumously, 1902, and a play, *Polypème*, was produced, 1904.

Samara. In botany, a dry, two or more celled fruit, elongated by wing-like extensions, as in the maple, sycamore, ash, etc. A popular name for them is keys, as ash-keys, etc. See Fruit.

Samarai. Island and port of the Pacific. The island is 3 m. S.E. of the S.E. end of the island of Papua, and is 250 m. S.E. of Port Moresby. It was discovered in 1873 by Captain Moresby, who called it Dinner Island, and it has an area slightly less than 1 sq. m. It is under the governmental control of Australia. The port serves the isolated settlements on the neighbouring goldfields of New Guinea, and has a wireless station. There is a steamer service to Port Moresby, Papua, and Sydney, Australia, sailings being made every three weeks.

Samaria. District in central Palestine. It was colonised by the remnants of the tribes of Manasseh and Ephraim, with an admixture of Assyrian immigrants. The city of Samaria was founded about 920 B.C. by Omri, who transferred the seat of government to it from Shechem. Destroyed by Sargon, it was rebuilt by Herod the Great, who styled it Sebaste. The city was captured by the British in 1918, and the district conquered by them in their campaign in Palestine. See Palestine.

Samaritans. Inhabitants of the region of Samaria, a small community of whom still exists in Nāblus, the ancient Shechem. After the fall of Samaria, 721 B.C., Sargon deported a large part of the population, and replaced it with captives brought from Babylonia, Syria, and Arabia (2 Kings 17). These and later colonists mingled with the old Hebrew population that remained, and the resultant new and mixed race came to be known as the Samaritans. The foreign colonists decided to worship Jehovah, the god of the land, but they blended this worship with their own heathen cults. This syncretism naturally offended the Jews, who were strict worshippers of Jehovah, and accounts for the strife between Jews and Samaritans that manifested itself early, and increased rather than diminished throughout the centuries (*cf.* John 4, v. 9; 8, v. 48).

When Jesus said a good word for a Samaritan, He added fuel to the fire of hatred that was raging already against Him. The Jews who returned from exile were not disposed to be friendly towards a people whom they regarded as half heathen, and the bitter feeling between the two peoples was intensified, either because the Jews refused to allow the Samaritans to participate in the cultus at the temple in Jerusalem, or because they would not permit them to help in the rebuilding of Jerusalem. It is said that, in retaliation, the Samaritans tried to prevent the latter undertaking (Ezra 4, v. 7; Nehemiah 4, v. 7).

However this may have been, the Samaritans decided to have a rival temple of their own, and in 332 B.C., according to Josephus, they were allowed by Alexander to build one on Mount Gerizim, near Shechem (mod. Nāblus), their holy city. About that time they made the Hebrew Pentateuch their one authoritative sacred book.

The claim of the Samaritans to be the only true descendants of Israel and their denial of the sanctity of Jerusalem and its temple were a constant cause of annoyance to the Jews. The friction between the two increased to such an extent that in the Jewish wars the Samaritans often aided the enemy. Naturally the Jews took reprisals, and in 128 B.C. John Hyrcanus destroyed the Samaritan temple on Gerizim. The Samaritans had also wars more peculiarly their own to wage. In the reign of Hadrian (A.D. 117-138), the Romans punished them for rebelliousness by destroying their sacred books.

When Christianity became the state religion of the Roman Empire, they were in frequent conflict with the Christians or the Roman emperors. In the reign of Justinian a Samaritan revolt (529) brought punishment of such severity that the Samaritans were deprived of their synagogues and other privileges. Under Justin II (565-578) they lost all their privileges, and were outlawed. They fared little better under the rule of Islam. During the Crusades Nāblus was plundered frequently. In 1517 it came under the rule of the Turks.

Samaritan religious customs and institutions have much in common with those of the Jews, but peculiar features have been added. The Samaritans lay great stress on the unity of God, and carefully avoid all anthropomorphic and anthropopathic expressions. With the Jews they shared the expectation

of a Messiah, but he was not to be greater than Moses. According to the Christian Fathers, they did not believe in angels, the resurrection, or a future life; but their own literature seems to prove that at any rate since the 4th century A.D. these beliefs have been held.

Their language is a dialect of Western Aramaic. The oldest manuscript of the Samaritan Pentateuch, ascribed by the Samaritans to Abisha, the great-grandson of Aaron, and preserved with great veneration at Nāblus, is not earlier than the 12th or 13th century B.C. A translation of this was made into an Aramaic dialect, and is known as the Samaritan Targum. The other Samaritan literature includes the Book of Joshua, a work in Arabic, dating perhaps from the 13th century; *El-Tōlīdeh*, a book of annals from Adam to modern times, in Samaritan-Hebrew, with an Arabic translation—a work begun in the middle of the 12th cent.; and *The Chronicle of Abulfath*, a compilation in Arabic, written A.D. 1355. See Jews; Palestine.

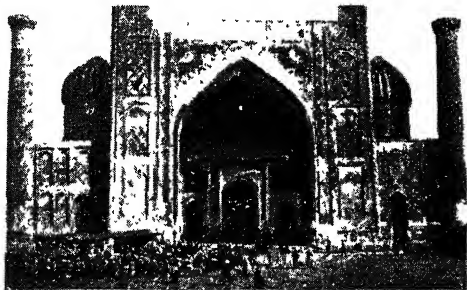
Samarium. One of the cerium family of rare earth metals, forming an almost insoluble potassium sulphate. The earth was first isolated in 1878 by Delafontaine. The element, chemical symbol Sm, falls in the third long period of the periodic table. It has an atomic number of 62; atomic weight, 150.43; melting point, 1,300° C.; specific gravity, 7.7 to 7.8. The metal is not easily prepared, because of its high melting point, but can be obtained by the electrolysis of the fused anhydrous chloride, mixed with one-third its weight of barium chloride. Samarium has a number of isotopes, the most abundant of which has mass 152. See Rare Earths.

Samarkand. Town of Uzbek S.S.R., giving its name to a region of the republic. It stands near the left bank of the Zarafshan (Kara Daria) and has been famous through history for its squares, gardens, and fountains, and the decoration of its public buildings. Since its occupation by Russia in 1868 a modern town has been built, with electric power and textile and leather plants, distinct from the native Mahomedan quarters. There is a rly. to Bokhara, 135 m. W. The chief trade consists in the export of corn, rice, silk, cotton, fruit, and horses. Samarkand, the ancient Maracanda, and the capital of Sogdiana, in the 14th century became the capital of the empire of Timur, who was buried here, and

the centre of the intellectual life of Mahomedan Asia. Babar, founder of the Mogul empire, seized

City of London school and the S. Kensington school of art, he was apprenticed at 16 to a firm of

artillery fire Canadian infantry fought towards Mons, first entered at midnight of Nov. 10-11.



Samarkand, Uzbek S.S.R. The Madrasah, or college of Shir Dar, in the city

Samarkand in 1511. It was long subject to the emirate of Bokhara until taken by the Russians. Pop. 134,346.

Samarra. Town of Iraq. It is situated on the left bank of the Tigris, 65 m. N.W. by N. of Baghdad, and was founded in A.D. 842 by the Abbasid caliph Motassim. Its brick mosque has a square-based minaret 163 ft. high, ascended by an external spiral stairway recalling the old Babylonian ziggurats, and copied 36 years later by Ibn Tulun at Cairo. Samarra is one of the four places of pilgrimage for Shiah Muslims. It was captured by the British, April 23, 1917. Photographic surveys of the Samarra region by the British Mesopotamian force revealed the planning of an ancient city 20 m. long and 2½ m. wide, above and below the present town, between the Tigris and a canal.

Sambalpur. District and town of Orissa, India. The dist. is part of the Chota-Nagpur plateau and occupies both sides of a section of the Mahanadi river. Rice is the chief crop. The town is on the left bank of the Mahanadi, and is the terminus of a branch of the rly. from Calcutta to Nagpur. Here Pandit Nehru laid in 1948 the foundation stone of the Hirakud dam. Area, 5,419 sq. m. Pop., dist., 1,182,622; town, 16,000.

Sambhal. Town of the Uttar union, India, in Moradabad dist. It is situated in the S. of the dist. on a branch rly., and has sugar refineries. It is built on a mound, the debris of an ancient city, and was important during the earliest period of Mahomedan rule. Pop. 53,887.

Sambourne, EDWARD LINLEY (1844-1910). British black-and-white artist. Born in London, Jan. 4, 1844, and educated at the

means of hatching in parallel lines. Some of his most delightful work is seen in his original illustrations to Kingsley's *The Water Babies* (1869). Sambourne died at Kensington, Aug. 3, 1910.

Sambre. River of France and Belgium. Rising in a forest in the dept.

of Aisne, it flows N.E. through Nord into the Meuse at Namur in Belgium. Its length is 112 m., and it is navigable for barges almost throughout; it is connected with the Oise and Schelde by canals.

Sambre, BATTLE OF THE. Name given to a final battle of the First Great War. It was fought between British and German forces, from Nov. 1, 1918, until the armistice of Nov. 11. The British 1st, 3rd, and 4th armies were engaged against the German 2nd and 18th. The general front of the British attack was from the Schelde, W. of Valenciennes, to Oisy, N. of Guise. Valenciennes was captured by an enveloping movement as a preliminary to the main battle. This capture was complete by Nov. 4, and from that time the story was one of steady British advance. The impediment to the advance was less the German fire than the difficulty of maintaining communications and supplies. The weather was deplorable, roads had been wrecked, and the rlys. mined with delayed-action charges. But by the night of Nov. 7-8 there were clear signs of a general German retreat. On Nov. 9 Maubeuge was captured without any German defence of this famous fortress. In the face of heavy



Linley Sambourne, British artist

When the news came that an armistice would take effect at 11 a.m. on Nov. 11, there was no halt to the advance. Canadians killed or captured the entire Mons garrison, and the firing remained heavy and the advance continued almost until the appointed hour. In the whole battle the British had advanced 25 m. and taken 19,000 prisoners, together with the second largest Allied capture of guns (460) in any engagement of the war, and every kind of store, munitions, rly. rolling stock, etc. The British line in the last map of the battle-front ran from Sivry in the S., through Erquelines, Bousoit, Jurbise, Herchies, Ghislenghien, and Lessines, to Grammont in the N.

Sam Browne. Name applied to the uniform leather belt worn by commissioned and warrant officers in the British army. Designed by General Sir Samuel Browne (1824-1901), it consists of a belt and two straps which pass over the shoulders, crossing at the back; though only the strap passing over the right shoulder is usually worn. There are rings for attaching the sword-frog. The Sam Browne belt was adopted in the field uniform of most of the Allied armies during the First Great War, but, after 1939, was not worn on active service in the British army.

Sambur Deer (*Cervus aristotelis*). Species of large deer, belonging to the family Cervidae,



Sam Browne belt with sword-frog attached



Sambur Deer. A male of this Indian species of deer

occurring in India and Ceylon. It stands about 4½ feet high at the shoulder, has dark yellowish-brown hair, and bears a fine pair of branched antlers, which sometimes exceed 3 ft. in length. The neck bears a conspicuous mane of long hair. The sambur is found in the forests, and visits its grazing grounds chiefly by night.

Samian Ware. Red or black earthenware of primitive type. It is supposed to have originated at



Samian Ware. Portion of a vase found among Roman remains at Manchester

Samos, the Greek isle, but was manufactured in every country that came under Roman influence. It is glazed and sometimes ornamented in relief.

Sammons, ALBERT EDWARD (b. 1886). British violinist. Born in London, Feb. 23, 1886, he was mainly self-taught. In 1908 he attracted the attention of (Sir) Thomas Beecham, becoming leader of the Beecham orchestra for five years; later he achieved distinction by his interpretation of Elgar's violin concerto, and edited that of Delius. Leader of the London string quartet for nine years, he introduced new works at sonata recitals given in conjunction with the pianist William Murdoch. He became professor of the violin at the R.C.M. He wrote *The Secret of Technique*.

Samnites. Ancient Italian people of Umbr-Sabellian stock. Starting from Sabine territory, they settled in the mountainous country between the plains of Apulia and Campania, their chief centre being Bovianum (Bojano). Their language was adopted from the subjugated Oscans. A warlike and aggressive people, they first came into collision with the Romans in 354 B.C., and the appeal of Capua for Roman aid led to the first Samnite war (343-341). The second war (328-304), in which the incident of the Caudine

forks occurred, ended in the victory of the Romans. In the third war (298-290) the Sabine power was broken at the battle of Sentinum in Umbria (295). Still determined enemies of Rome, they fought for Pyrrhus and Hannibal, and in the Social War (90-88) they were the mainstay of the rebellion. During the war between Marius and Sulla, they joined the former, and were annihilated at the Colline gate, Nov. 1, 82. See Rome.

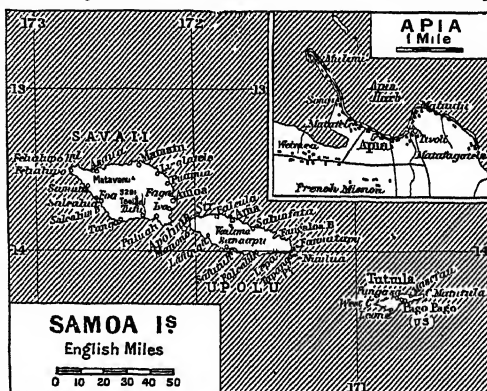
Samoa OR NAVIGATORS' ISLANDS. Group of nine large islands and five islets in the W. Pacific. They lie 130 m. N. of Tonga, and 400 to 500 m. N.E. of Fiji. Except Rose Island they are of volcanic origin and are fringed with coral reefs. By an agreement between Great Britain and Germany made

in 1899 and ratified by the U.S.A. in 1900, Great Britain renounced all rights in the group in favour of Germany in the case of Savaii, Upolu, Apolima, and Manono, and for Tutuila and the remainder in favour of the U.S.A. When the First Great War broke out New Zealand forces on Aug. 30, 1914, occupied without bloodshed the German islands, which were subsequently held by New Zealand under mandate and trusteeship. The administration, inaugurated in 1920, includes a legislative council consisting of six official members, two European non-official members, and four nominated native members. There is also an elective native advisory council. Of the

total area of more than 1,250 sq. m., Savaii has 660 sq. m.; Upolu more than 500 sq. m.; Tutuila 77 sq. m. British Samoa contains 69,532 inhabitants, U.S.A. Samoa 10,055.

The islands are elevated and forest-clad in the interior; in Savaii a height of 5,413 ft. is attained; the coasts are usually high and steep. The only good harbour is at Pago Pago, on Tutuila, a U.S.A. naval station. Copra, cacao, rubber, and fruit are the principal products. Apia, on Upolu, is the chief British town.

The group was probably discovered in 1722 by the Dutch navigator Roggweein; in 1768 Bougainville gave it the name Navigators' Islands; in 1830 John Williams introduced Christianity



Samoa. Map showing some of the islands of the Pacific group

therein. Internecine struggles between rival chiefs for supreme authority commenced in 1868, and led to the interference of Britain, Germany, and the U.S.A., which culminated in the agreement of 1899-1900. In 1905 a volcano, in an interior valley in Savaii, emitted quantities of lava which filled the main and side valleys and



Samoa. Natives of these Pacific islands. Left, a professional orator; right, girls making kava, a beverage concocted from the root of the same name



Samovar, used by the Russians for making tea

flowed out to sea. Samoa is one of the places at which the International Date Line (*q.v.*) deviates, in order to give the islands the same calendar as New Zealand.

In 1890 R. L. Stevenson (*q.v.*), travelling in search of health, made his home at Vailima, where he lived for the rest of his life, and his sympathy with the friendly natives, by whom he was surrounded, drew him into political controversy with the German officials. The substance of his complaints was embodied in A Footnote to History, 1892. See Apia. Consult History of Samoa, R. M. Watson, 1919; Modern Samoa, F. M. Keesing, 1934.

Samos. Greek island in the Aegean. It lies off the W. coast of Asiatic Turkey about 40 m. S.W. of Izmir, and has a length of 27 m., a breadth at its widest of 10 m., and an area of about 180 sq. m. It is mountainous, the highest mt. being Kerkiis, 4,700 ft., and has many fertile valleys, with forests leading up the slopes of the hills. Silver, lead, and marble are produced, and fine wine, fruits, and tobacco exported. Colonised by the Ionians about 1000 B.C., Samos passed to the Persians in the 6th century, but regained its freedom after the victory of Mycale, 479. Rome took it in 84 B.C. It was a centre of art, and renowned for its poets and sculptors. The chief city was Samos, near which was the famous Heraeum, or temple of Hera. The modern capital is Vathy, at the head of a small bay looking N. Pop. 77,858. For its part in the Second Great War see Dodecanese.

Samosata. Ancient city at Samsat, on the right Euphrates bank above Carchemish, N. Iraq. It is situated at the mouth of the Euphrates gorges, and a prehistoric settlement is indicated by cliff-dwellings. An inscribed sculptured stela marks the region as a Hittite outpost, which became subject to Assyria in 708 B.C., and eventually to Rome in A.D. 72. *Pron.* Samossahta.

Samothrace. Greek island in the Aegean Sea. It is 8 m. in length by 6 m. in width, and rises to 5,240 ft., the highest point in the Aegean archipelago. Its area is 30 sq. m. Pop. est. 5,000.

Samovar (Russ. *samovar*). Russian hot-water urn, principally used for making tea. The word itself means self-boiler. It is usually made of copper, and is kept always boiling with the least evaporation, by means of a tube running upwards through the urn, and filled with lighted pieces of charcoal. A similar vessel is used in China for keeping soup hot.

Samoyed. Russian name for a people of primitive Altaian stock and speech in Arctic Russia (tundra dwellers). Extending from the Kanin to the Taimir peninsula, they number some 27,000. Darker, flatter-faced, narrower-eyed than the Finnic stock, they may descend from Yenisei Tubas driven N. and W. by stronger Ugrian tribes. Under a Christian veneer nature-worship and shamanism for long prevailed.

The domestic dog of the Samoyed people—generally called the Samoyed—was introduced into Great Britain at the end of the 19th century. The Samoyed is put to many uses in his own land: he herds reindeer, guards tents, and is used in hunting bears. This dog



Samoyed natives from Archangel

has also been of great use to Arctic and Antarctic explorers. In colour the animal is pure white, or white with biscuit-coloured ears.



Sampan in Hong Kong harbour

Sampan. Light boat about 15 ft. long in common use in the Eastern inland and coastal waters.

It is wholly or partly covered in and sometimes used as a house-boat.

Samphire (*Orihimum maritimum*). Fleishy perennial herb of the family Umbelliferae. It is a native of the coasts of the Mediterranean, Black Sea, and N. Atlantic, growing on rocks above sea level; it is common on rocks



Samphire. Flower head and much-divided leaves

in S. and W. England, and S. Ireland, and rare in N. England and Scotland. It has a woody base and stout stem, which, like the leaves, is of a blue-green tint. The real outline of the leaves is wedge-shaped, but they are so broken up into slender, rounded leaflets that the latter look like leaves. The minute flowers are white, but the umbels in which they are clustered give the general effect of yellow. The leaves have a salt, spicy flavour, and are made into a kind of pickle.

Sample (O.F. *essample*; Lat., *exemplum*). A specimen; a part taken from a bulk and assumed to be typical of it. Samples are of great importance in trade, in manufacture, and in statistical investigation of all kinds. Many orders given to wholesalers and manufacturers are based on samples. Much natural produce, imported or home-grown, is sold by auction on sample. In such cases it is implied that the sample shall reasonably represent the bulk, and that the buyer shall have a reasonable opportunity of comparing the bulk with the sample. To lessen the likelihood of disputes through sale by sample,

organizations of merchants have wherever possible agreed on standard samples or grades of goods, and have arranged standard forms of contract with a scale of allowances for deviations from the stipulated grade. Coffee, rice, tapioca, spices, wheat, maize, jute, hemp, cotton, and rubber are all thus graded. Metals, chemicals, etc., are graded by analysis. During the 20th century many forms of standard specification have been introduced for materials, components, etc., so that sampling of them is no longer necessary. The international postal union has arranged special facilities for the sending of samples from one country to another; the G.P.O. gives special facilities through its sample post (*consult P.O. Guide*).

Manufacturers sample (a) materials purchased, to ensure that they are as ordered; (b) goods manufactured, to see that they are of the required quality; (c) goods in process of manufacture, to ascertain that the manufacture is proceeding within the limits of accuracy expected and that cutting tools, etc., are functioning properly.

Most statistical investigation involves sampling, i.e. the use of a few items selected from a much larger group in order to study the characteristics of the whole group. Thus, the Gallup poll aims at discovering the views of millions of people by considering those of a few thousand. The theory of such sampling is an important part of modern statistical method. See Public Opinion.

Sampler (late Lat. *exemplarium*, a copy). Piece of embroidery usually on canvas or silk, worked as a specimen of skill in needlework. Samplers, which in England date from the 17th century onwards, continued in fashion until well into the 19th century, and many interesting specimens are



Sampler. An 18th century woollen sampler

preserved in private ownership, and in museums. In its simplest form the sampler consisted of the letters of the alphabet, but more elaborate designs are common, e.g. maps of England and Wales.

Sampling. In mining, obtaining a portion of ore which is representative in all respects of the whole for the purposes of assaying (*q.v.*).



Samson strangling the lion. From the wood engraving by Lord Leighton, F.R.A.
By courtesy of George Routledge and Sons, Ltd.

Sampson, ABEL. Character in Scott's novel *Guy Mannering*. The personality of Dominie Sampson, a lovable village schoolmaster, whose favourite exclamation "Prodigious!" is proverbial, was suggested by Dominie Sanson, sometime tutor in the family of Scott's uncle at Elliection.

Samshu (Chinese *san*, three; *shao*, fire). Chinese alcoholic beverage, distilled from rice or millet.

Samshui. Town in Kwangtung prov., China. Situated at the junction of the N. and W. Rivers, 30 m. W. of Canton, it was opened as a treaty port in 1897. The town walls date from 1527. Pop. 8,581.

Samson. Biblical character. A Danite who adopted the calling of a Nazirite, he became one of the judges of Israel. A man of miraculous strength, for which his name has become a synonym, he was a redoubtable foe of the Philistines until, succumbing to the influence of Delilah (*q.v.*), who cut off his hair, he fell into the hands of his enemies. They put out his eyes, and that he might make them sport in connexion with a feast celebrating his capture, had him brought to the house in which they were assembled. His strength having been restored to him in answer to

prayer, he pulled away the supports of the building and was involved with the Philistine assembly in the common ruin (Judges 13-16). His story inspired a poem by Milton, an oratorio by Handel, and an opera by Saint-Saëns.

Samson Agonistes. Dramatic poem by John Milton published in

1671. Its subject is the death of Samson (*v.s.*), but it is chiefly remarkable for the passages given to the chorus, and the lines in which Samson laments his blindness.

Samson and Delilah. Opera in three acts, text by Ferdinand Lemaire, music by Saint-Saëns. Based on the Biblical story, it contains the well-known aria *Softly A wakes My Heart*. The most popular of the composer's dram-

atic works, the music is voluptuous. First produced at Weimar under Liszt, Dec. 2, 1877 (having been rejected by the Paris opera, though later becoming a stock piece there), it was performed at Covent Garden (in concert form), 1909, and first given in English by the Moody-Manners co. at Dublin, 1910.

Samsonite. Permitted explosive of the plastic gelatine type, containing approximately 60 p.c. nitroglycerine in addition to 3 p.c. nitro-cotton. The explosive is of a soft rubber-like consistency and is able to withstand moisture, so that it is of great advantage in wet workings. The high rate of detonation of this type of explosive is particularly valuable in stone drifts or in very hard ripplings. See Permitted Explosives.

Samsonov, ALEXANDER VASILIEVITCH (1859-1914). Russian soldier. Born Feb. 2, 1859, he entered the cavalry in 1875, and became a general in 1902. In the Russo-Japanese War, 1904-05, he commanded a Siberian Cossack brigade. On the outbreak of the First Great War he was placed in command of the army of the Narev, which invaded E. Prussia, Aug., 1914. After winning the battle of Frankenau and ad-

vancing to Allenstein, he was defeated at Tannenberg and shot himself on Aug. 31.

Samsun. Turkish seaport on the Black Sea. The ancient Amisus, it lies 170 m. W. of Trabzon. It has an open roadstead and exports wool, cereals, and tobacco, of which commodity the vilayet of Samsun leads in Turkish production. Pop. vilayet, 409,354; town, 38,417.

Samuel. First prophet of Israel and the last of the judges. He was born at Ramah, in answer to the prayers of his mother Hannah, was dedicated to the service of God from birth, and was taken to Eli the priest to serve him as a boy attendant. The misconduct of Samuel's sons, who were expected to succeed to the judgeship, led to a popular demand for a king, and Saul was chosen. Samuel was often brought into conflict with him, and later he anointed the youth David, who afterwards took refuge with him from the king's anger. In his later days he seems to have conducted a school of the prophets, and he had a house of his own at Ramah, where he was buried. The name has become a popular one in both Christian and Jewish communities.

Samuel, THE BOOKS OF. The O.T. First and Second Books of Samuel are so called in the Hebrew Bible because one of the chief characters in their story is the prophet Samuel. In the Septuagint (cod. Vat.) they are called the First and Second Books of Kingdoms, and in the Vulgate the First and Second Books of Kings (our 1 and 2 Kings being the Fourth and Fifth Books). The contents of the books of Samuel fall into five sections: (1) Eli and Samuel, 1 Sam. 1-7; (2) Samuel and Saul, 1 Sam. 8-14; (3) Saul and David, 1 Sam. 15-31; (4) David, 2 Sam. 1-20; (5) an Appendix, 2 Sam. 20-24. The period covered is therefore from about 1070 or 1050 to 970 B.C. The only ancient source mentioned in the books is the Book of Jashar (2 Sam. 1, v. 18; cf. Josh. 10, v. 13). From this, David's elegy over Saul and Jonathan is said to have been taken. Other poems include the Song of Hannah (1 Sam. 2, vv. 1-10), the language of which has literary parallels in the Psalms. The song has even been described as an "extra-canonical Psalm."

The text of the books of Samuel presents a number of literary and historical problems. There are sometimes two rather different accounts of the same events (cf.

1 Sam. 9, v. 1-10, v. 16 with 10, v. 17-27; 1 Sam. 13, vv. 8-14 with 15, vv. 1-30); or marked differences in literary style (cf. 1 Sam. 1-3, with 2 Sam. 8). Moreover the text of 2 Samuel has suffered greatly from corruption. The books in their present form can hardly have been written by Samuel. They are composite works containing narratives of various dates. Consult Samuel, by H. P. Smith, in International Critical Commentary, 1899.

Samuel, HERBERT LOUIS SAMUEL, 1ST VISCOUNT (b. 1870). British politician.



1st Viscount Samuel,
British politician

Born of Jewish parentage at Liverpool, Nov. 6, 1870, he was educated at Balliol, Oxford, and, entering politics in 1895, was Liberal M.P. for Cleveland, 1902-18, and Darwen, 1929-35. As parl. under-secretary to the home office, 1905, he was responsible for setting up the probation system and juvenile courts. He entered the cabinet as chancellor of the duchy of Lancaster, 1909. P.M.G., 1910, president of the local govt. board, 1914, and again P.M.G. and chancellor of the duchy of Lancaster, 1915, he was home secretary, 1916, when he introduced Summer Time (g.v.). He left office with Asquith, 1916.

Samuel was among the men of note whose support Chaim Weizmann secured during the First Great War for the cause of Zionism; and the choice of Samuel in 1920 as first high commissioner for Palestine under the British mandate proved a happy one. He remained in Palestine until 1925. After his return he was chairman of a commission of enquiry into the coal industry, and assisted in the settlement of the General Strike (g.v.). He led that section of the Liberal party which adhered to free trade, and afterwards took a leading part in the formation of the National govt., 1931, in which he was again home secretary, resigning on the free trade issue 1932. Knighted in 1920, raised to the peerage in 1937, he was Liberal leader in the house of lords from 1944.

In his later years he acquired a new reputation as a philosopher (he was president of the British, later royal, institute of philosophy from 1931), and as a broadcaster.

His publications included Philosophy and the Ordinary Man, 1932; Belief and Action, 1937. His Memoirs appeared in 1945.

Samurai (Jap., guard). Former Japanese military class. In early feudal times the term was applied to all who bore arms, but eventually it was restricted to the gentry, and roughly corresponded to the esquires of medieval times, as distinguished from the daimio or nobles. On the abolition of the feudal system in 1871 the samurai were forbidden to wear swords, and in 1878 the designation was changed to *shizoku* or gentry. In his A Modern Utopia H. G. Wells used the term samurai to suggest an intellectual aristocracy of the modern world.

San. River of Poland. Rising in the Beskid Mts. (Carpathians), it flows N.N.W., then E. past Przemysl (g.v.), thence N.W., and joins the Vistula 4 m. N.E. of Sandomierz. Its length is about 260 m.

The area of the San was the scene of two major battles of the Eastern Front in the First Great War. The first was fought between Austrians and Russians, Oct. 13-Nov. 6, 1914. The Austrians attacked in an attempt to relieve Przemysl but the Russians defended the San crossings stubbornly, and a struggle of increasing violence ended in complete Russian victory and a Russian advance towards Cracow. The second battle was fought between Austro-German troops and Russians, May-June, 1915. After losing battles at Donajetz the Russians retreated to the San, and a series of fierce Austro-German attacks and Russian counter-attacks, resulted in the Russian evacuation of Przemysl.

During the Second Great War, the Russians began a new offensive in Poland in Jan., 1945, from a bridgehead across the San, near Sandomierz (g.v.).

Sana or SANAA. Town of Arabia, capital of the imamate of Yemen. Lying in a fertile valley, about the middle of the E. side of the Yemen, it is a walled town with eight gates,



Samurai in official
dress

has a handsome mosque, and does a considerable trade in coffee and fruit, besides manufacturing silks, arms, and jewelry. Population about 25,000.

Sanad OR **SUNNUD** (Arab., a law). Term used in India for a document, such as a patent, charter, or warrant, or any official instruction or decree.

Sanaga. River of Cameroons, French Africa. It rises on the Central Cameroon plateau, and flows in general S.W. to the Bight of Biafra, at Malimba, about midway between the mouths of the Cameroon and the Nyong. Below the confluence with the Uyim tributary are the Nachtigal Rapids. The chief town on its banks is Edea, where the river is bridged by rly. and the road from Douala.

San Angelo. City of Texas, U.S.A., the co. seat of Tom Green co. Situated 240 m. S.W. of Fort Worth, it is a rly. junction. It trades in the produce of the surrounding dist., exporting chiefly cattle and sheep, wool and cotton. Sheet metal and saddlery are other industries. Formerly it was a centre of cowboy life. Pop. 25,802.

San Antonio. Third city of Texas, U.S.A. The co. seat of Bexar co., it stands on the San

Sanatorium (Lat. *sanare*, to heal). Building where sick persons are treated, especially those suffering from tuberculosis. Most boarding schools have a sanatorium with a matron in charge. The word is also used for an establishment in the country where convalescents reside.

San Bernardino. Mountain pass of Switzerland, in the Mesocco valley and the canton of Grisons. It is on the road from Coire (Chur) to Bellinzona, and reaches an alt. of 6,770 ft. The pass was known to the Romans, but its present name comes from S. Bernardino of Siena, who preached here in the 15th century. The carriage road was constructed 1818-23. The summit, on which is a hospice, is $4\frac{1}{2}$ m. N. of the village of San Bernardino, which has celebrated mineral springs.

San Bernardino. City of California, U.S.A., the co. seat of San Bernardino co. It is 58 m. E. of Los Angeles, and is served by the S. Pacific and other rlys. Among its industrial establishments are rly. workshops, machine shops, foundries, and lumber mills. The surrounding dist. is noted for oranges and lemons. Founded in 1851 by a company of Mormons, who were recalled to Utah by Brigham Young in 1857, San Bernardino was incorporated in 1864. Pop. 43,646.

San Carlos de Ancud. Seaport of Chile, capital of the prov. of Chiloe. Situated on the N. coast of Chiloe Island, at the head of a bay in Chacao Channel, 575 m.

S. of Valparaíso, it has a safe and spacious harbour. Founded in 1768, it was long resorted to by Antarctic whale fishers, and was the last Spanish stronghold in Chile, surrendering only in 1826. Pop. est. 3,000.

San Cataldo. City of Sicily, in the prov. of Caltanissetta. It stands in the valley of Mazzara, 5 m. by rly. W. of Caltanissetta. In the vicinity are sulphur mines. Population 18,000.

Sanchez, THOMAS (1550-1610). Jesuit author. Born of noble parents at Cordova, he entered the Society of Jesus, and acquired a reputation for sanctity. He wrote a famous treatise on marriage, *Disputationes de Sancto Matrimonio*

Sacramento, published at Genoa in 1592. This book, written by a man the purity of whose morals is undoubted, is stated to exceed in its pornography the efforts of secular writers. Sanchez died at Granada, May 19, 1610.

Sancho Panza. Squire and attendant on Don Quixote. He is a farm labourer, who, mounted on his ass Dapple, accompanies the Don on his adventures, ever dreaming of the governorship of an island with which the knight promises to reward him. Sancho Panza (Panza means paunch) is a droll person, a coward, a misuser of words, and repeater of innumerable proverbs. Sancho Panza, as the victim of a joke, is dressed in fine clothes and placed at a banquet; but the court physician strikes each dish with a wand as soon as Sancho has tasted it, and a page thereupon bears it swiftly away, leaving the squire hungry. See Don Quixote.

San Cristóbal. Town of Venezuela, capital of the state of Táchira. It stands on the Rio Torbes, amid the Andes, at an alt. of 2,770 ft., 105 m. W.S.W. of Mérida. It is on the trans-Andine highway to Caracas. Cattle-rearing and production of coffee are the chief occupations. The town was destroyed by an earthquake in 1875. Pop. 22,000.

San Cristóbal de las Casas. Town of Mexico, in the state of Chiapas. It occupies the site of an ancient Indian city, 485 m. S.E. of Mexico City. Formerly the state capital, it has a cathedral, and manufactures textiles. Bishop Las Casas, the great Spanish defender of the aborigines of the Spanish Main, resided here. Pop. 15,000.

Sancroft, WILLIAM (1617-93). English prelate. Born at Fressingfield, Suffolk, Jan. 30, 1617, he was educated at Emmanuel College, Cambridge. He became chaplain to Charles II, master of Emmanuel College, and in 1664 successively dean of York and of S. Paul's. After

the Great Fire he, with Wren, devoted his energies for many years to the rebuilding of the cathedral. In 1678 he became archbishop of Canterbury, carrying out his duties with notable single-mindedness and strength of



San Antonio, Texas. The Mission of San José de Aguayo, built by the Spaniards in 1720-31.

Antonio river, 212 m. by rly. W. of Houston, and is served by rlys. The San Fernando cathedral is notable, and here is Trinity university, founded 1869. San Antonio is an invalid resort, with hot mineral wells.

It is the h.q. of an army area. There are some 300 manufacturing plants, a large trade in livestock, and annual royalties of some 125 million dollars accrue from oil-wells near by. Skyscraper buildings contrast with old Spanish settlements. San Antonio was permanently settled in 1718, and became a city in 1809. In 1836 Fort Adams was stormed by Mexicans, the entire garrison of 188 being massacred. Pop. 253,854.



William Sancroft, English prelate.

purpose in an age of political profanity. Sancroft was one of the Seven Bishops (*q.v.*) who in May, 1688, drew up and signed the petition against the second declaration of indulgence (*q.v.*). He refused to recognize William of Orange as lawful sovereign, and, with five other nonjuring bishops, was suspended in 1689 and deprived of the archbishopric in Feb., 1690. He died at Fressingfield, Nov. 24, 1693. See Nonjurors.

Sanction (Lat. *sanctio*, a making sacred). Authority or confirmation derived from law, custom, etc., *e.g.* the sanction of public opinion. In jurisprudence, sanction is used in a special sense, meaning a penalty imposed for neglect to carry out the terms of a covenant or agreement, particularly applied to a defeated country, *e.g.* Germany under the terms of the treaty of Versailles of 1919.

The League of Nations was authorised to apply economic sanctions against any member who persisted in waging aggressive war. Its only attempt to do so, against Italy in 1935, was unsuccessful. See Italy: History.

Sancti Spiritus OR SANTO ESPIRITU. Town of Cuba, in the prov. of Santa Clara. It is about 25 m. by rly. N. of Tunas de Zaza, its port, and 240 m. by rly. from Havana. Founded in 1514, its chief feature of interest is its old church. Sugar and high-grade cigar tobacco are the chief products, and are exported. Pop. 92,299.

Sanctuary (Lat. *sanctus*, sacred). In a religious sense, any consecrated place, or a place where sacred things are kept. Specifically, the term was applied to the Temple at Jerusalem, especially to that part of it, the *sanctum sanctorum*, or Holy of Holies, which none but the high priest might enter, and then only on the Day of Atonement (Lev. 4; Num. 10; 2 Chron. 20 and 26; Josh. 24). In Ps. 20 it means God's dwelling-place on Mt. Zion; in Isaiah 8 and Ezek. 11, a place of refuge. Christian churches, like pagan temples, at one time afforded temporary sanctuary from the processes of the law, a privilege abolished in England in the 17th century, but still supposed to attach to Holyrood in Scotland. A criminal who claimed such sanctuary had to confess his crime and abjure the realm. The Sanctuary at Westminster was a privileged precinct; here the widow of Edward IV sought security, and here Skelton found shelter from Wolsey. The name survives in the area

called Broad Sanctuary. That part of a church in which the altar is placed is known as the sanctuary. See Alsatia; City of Refuge; Westminster.

Sanctus, THE (Lat., holy). Hymn said or sung before the prayer of consecration at the Holy Communion service. The words Holy, Holy, Holy, etc., are based on Is. 6, v. 3; Ps. 118, v. 26; and Matt. 21, v. 9; but the closing words were altered in 1549 from Hosanna in the Highest to Glory be to Thee, O Lord most High. The Sanctus, also known as the Tersanctus, the seraphic hymn, and the angelic hymn, appears in most liturgies. In the R.C. rite, except in the pontifical chapel and during exposition of the Sacrament, a small bell, the sacring bell, is rung.

Sand. Loose, incoherent mass of small particles of various minerals. If the particles are more than about 0.1 in. diameter, the term gravel is used. The chief minerals in sand are quartz, mica, feldspar, etc., and it is formed by

sand is often applied to them. Compacted sands of geological deposits are known as sandstones.

Apart from their value as a source of material present in small quantity, *e.g.* gold in quartz, sands are widely used in industry. In making glass, silicious sands have been used, though pulverised quartz is now more usual (*see* Glass). In building, sand is an essential constituent of concrete, the properties of the finished article depending on the grading of the sand according to the size and angularity of its grains. In foundry work, moulding sand is much used, though a certain amount of clay is necessary to bind the mass together coherently. Sand is also used for lining the furnaces for brick making. Lime-sand bricks, which are very strong, are made by moulding a mixture of lime and sand, moistened with water, and subjecting the block to high-pressure steam.

Sand. River of S. Africa. It rises in the Wittebergen, O.F.S., and flows mainly W. until it joins the Vet. On the banks of this stream was signed the convention by which, in Jan., 1852, Great Britain granted independence to the emigrant farmers beyond the Vaal river. See Orange Free State; South Africa; Transvaal.

Sand, GEORGE (1804-76). Pen-name of Armandine Lucile Aurore Dupin, Mme. Dudevant, French novelist and letter-writer. She was born in Paris, July 5, 1804, a month after her parents' marriage, to Maurice Dupin, a soldier, and Sophie Victoire Delaborde, a typical grisette. Her father was killed by being thrown from his horse when Aurore was a child, and for a time she was brought up in an old manor house at Nohant, Indre, by her paternal grandmother, a daughter of Maurice de Saxe.

The rest of her life was the passing from one disillusion to another; disillusion with mystical Catholicism in the Convent des Anglaises at Paris; with married life, when her husband, Casimir Dudevant, took to drink—she married him in 1822 and left him, after the birth of two children, in 1831; with romanticism, after her trip to Venice with Alfred de Musset in 1834, and her stay at Majorca with Chopin, 1838-39; with socialistic and republican idealism, after the revolution of 1848; with the empire after Sedan and the Commune. Towards the end she wrote to Alexandre Dumas fils: "I believe henceforward without



After A. Charpentier

the chemical and mechanical disintegration of rocks by weathering and other causes. Those sands which contain the greatest amount of quartz are nearly white, and form the silver or glass sands of commerce, used for polishing, etc. Green sands, which cover a large part of the bed of the ocean, contain glauconite. New sands are composed of sharp-edged particles. The older are smoother, consequent on the constant movements of the particles together. Desert sand grains are usually more rounded than water-worn grains of the same size; the term millet-seed

illusion, and that is the secret of all my little strength."

After 1831—when she entered the life of the Latin Quarter, with ideals of woman's emancipation, which led her to adopt male attire—she wrote 120 volumes: novels, autobiography, letters, and plays which reflect the successive stages of her emotions and experiences, her sympathy with suffering, her sensitiveness to art in all its phases, and her love of rural life. From 1848 her home was at No-hant, where she died June 8, 1876.

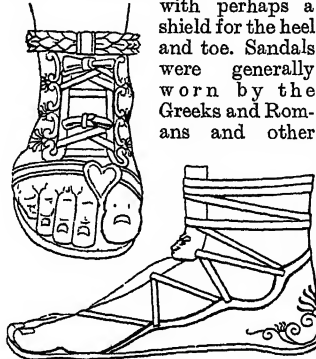
George Sand's first novel, *Rose et Blanche*, 1831, was written in collaboration with Jules Sandeau and published as by Jules Sand. Among the more noteworthy of its successors are *Mauprat*, 1837; *Consuelo*, 1842-44; *Lucrezia Floriani*, 1847; *La Petite Fadette* and *François le Champi*, 1848, dramatised by herself, 1849; *Les Beaux Messieurs de Bois-Doré*, 1857; *Le Marquis de Villemer*, 1861; *Mlle. la Quintinie*, 1863; *Flammarande*, 1875. Her picture of Alfred de Musset as Jacques Laurent, in *Elle et Lui*, 1859, was supplemented by her correspondence with him, published in 1897 and 1904. Of her other correspondence that with Flaubert is the most interesting. Her *Histoire de Ma Vie*, 1876, fills several volumes. See *Chopin*; *Musset*, A. de.

Bibliography. Works, 120 vols., 1862-84; *Lui et Elle*, P. de Musset, 1859; *Lives*, W. Karenine, 3 vols., 1899-1912; R. Doumic, 1909; G. S. et Alfred de Musset, in *Études et Portraits*, P. Bourget, 1906; *Intimate Journal*, trs. M. J. Howe, 1929; *Letters*, trs. V. Lucas, 1930; *The Other George Sand*, M. Toesca, 1947.

Sandakan. Seaport of British North Borneo. It stands on the N. point of the Bay of Sandakan, which provides one of the finest harbours in the East. Now the headquarters of the east coast residency, it was formerly the

capital of the colony and a fortified place, but was completely burnt by the Japanese during the Second Great War, in May, 1945. Timber, forest produce, rubber, copra, and cutch provided industries for a pop. largely Chinese and variously estimated up to 20,000.

Sandal (Persian, slipper). Light shoe consisting of a sole attached to the foot by straps or thongs, with perhaps a shield for the heel and toe. Sandals were generally worn by the Greeks and Romans and other



Sandal. Patterns of light shoe worn in ancient Rome

people of antiquity, and among the Romans especially were very elaborate and showed exquisite workmanship. They were made of leather, wood, cork, wickerwork, and even gold and silver. Primitive forms of leathern sandals are still worn by the Italian peasants, and by certain friars. See *Boots* and *Shoes*, colour plate.

Sandal Magna. Village of the W. Riding of Yorkshire, England. It is 3 m. S.S.E. of Wakefield, and connected therewith by rly. and bus. It is famous for the remains of its castle built about 1300. It was a stronghold of Richard, duke of York, who from Sandal went to the battle of Wakefield, which was fought near here. See *Wakefield*, Battle of.

Sandalwood (*Santalum album*). Small evergreen tree of the family Santalaceae. A native of the E. Indies, it has oval or lance-shaped leaves with pale undersides. The heart-wood when dry gives off a sweet perfume, and is esteemed for incense.

Sandalwood Oil. Oil distilled from wood of *Santalum album*. It is a viscid pale yellow oil with strong aromatic odour, and is used in medicine to soothe inflammation of the urinary tract; also in perfumery.

Sandarac (Gr. *sandarake*, red sulphide of arsenic). Variety of resin found in N. Africa. A product of the sandarac tree, *Callitris quadrivalvis*, a native of Algeria,

it is a pale yellow resin which becomes brittle on drying and is soluble in turpentine. Known also as gum juniper, it is used in the manufacture of varnishes.

Sanday. One of the Orkney Isles (q.v.). It is 2 m. N. of Stronsay, and its area is 26 sq. m. Its coastline is irregular and its surface generally flat, except in the W., where it rises to a height of 175 ft. Pop. est. 1,500.

Sandbach. Urban dist. and market town of Cheshire, England. It stands 4 m. N.E. of Crewe by rly. It has a grammar school, founded in 1594. In the market place are two antique crosses dating from the 7th century. Manufactures are road transport vehicles, motor bodies, chemicals, salt, silk, and wire. Pop. 8,700.



Sandbach, Cheshire. Crosses in the market place
Valentine

Sandbag. Small sack filled with sand or earth and used in the making of trenches, bomb-proof shelters, etc. Sandbags are made of hessian, and when filled with about half a cubic foot of earth or sand they measure over all about 20 ins. by 10 ins. by 5 ins., and weigh about 60 lb.

Sandbank. Accumulation of finely divided alluvium in the bed or estuary of a river. Rivers acquire a load of silt from the erosion of the banks, from the washing off the valley surface of soil, and from the gradual disintegration of rocks and stones rolled along the upper course. The load which the stream can transport depends largely upon the speed of the water, and whenever the stream slackens some of the load is deposited on the river bed; this deposit forms a sandbank. Near the river mouth salt water may mingle with the muddy fresh water and cause coagulation of the clay, which rapidly settles and accumulates. Hence lower courses of unregulated rivers, such as the Congo, are marked by a



Sandalwood. Leaves and flower sprays. Inset, single flower



stead of sand as the abrasive. The jets or nozzles of the blasting pipe are themselves subject to intense and prolonged abrasive action, and for this reason they are often made of an artificial material, e.g. boron carbide, claimed to be the hardest material made by man. Compressed air is used to project the sand, shot, or grit, pressures up to 100 lb. per sq. in. being employed for steel, and lower pressures for softer materials.

Sand-box. Receptacle fitted on a rly. vehicle or tramcar, containing grit for sanding the rails when greasy. It is fitted

having allusion to this fact. Unripe fruits used to have the seeds extracted by cutting into the centre. They were then bound round with wire and used to hold the fine sand formerly employed in place of blotting-paper.

Sandby, PAUL (1725-1809). British artist. Born at Nottingham, he gained early employment



Paul Sandby,
British artist
After P. Jean

in the military drawing school at the Tower of London, and was later draughtsman to the survey of the Scottish Highlands, and drawing master at Woolwich. He was an original

member of the Royal Academy, and one of the first to apply water-colour to topographical drawings. Sandby greatly influenced the development of water-colour art and introduced the aquatint process of engraving. His etchings, e.g. Cries of London, are well known. He died in London, Nov. 9, 1809.

Sand Clock. Instrument used by the Greeks for measuring time. In one form, sand passed successively through the compartments of a drum-shaped cylinder acting as a pulley to a cord with a counter-weight, the rapidity of motion being determined by the quantity of the sand, or the bore of the orifice through which it escaped. See Clock.

Sand-crack. Crack or fissure in the horn of a horse's hoof. It may be either in front or at the side, and appears to be most common in districts with sandy soils, hence the name. Severe cases cause lameness with inflammation.

Sandefjord. Seaport and watering-place of Norway. Situated at the head of the Sandefjord, an inlet of the Oslo Fjord, it is 32 m. direct and 54 m. by rly. S.S.W. of the capital. It has sulphurous, saline, and chalybeate springs. Pop. est. 5,000.

Sandeman, ROBERT (1718-71). Scottish setary. Born in Perth, where he followed the occupation of a linen manufacturer, he came under the influence of John Glas (q.v.), whose daughter he married, and with Glas founded the sect known as Glassites (q.v.)

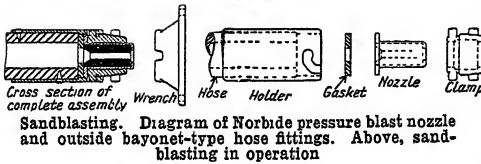


Robert Sandeman,
Scottish setary

series of sand-banks which continuously alter their shape and position as the river varies its speed, and the set of the tidal and other currents changes. When the bank forms an obstacle to the entrance of ships by forming a submarine ridge it is frequently known as a sand-bar.

Estuarine banks sometimes appear above water-level and immediately wind action piles the surface sand into a dune; a bank of this type may stretch across the estuary. Shingle banks, such as that off the mouth of the Adur in Sussex, are due to the tidal current rolling shingle along the coast until it accumulates upon a growing sandbank.

Sandblasting. Use of a stream of sand suspended in air as an abrasive. Sandblasting is used to give a "ground-glass" effect; if parts of a sheet of plain glass are protected by a resistant mask or stencil, a pattern is produced, thus names, etc. can be left imperishably on the surface. Etching by acid is an alternative means which has largely replaced sandblasting. Sandblasting is employed for cleaning the walls of buildings. Similar apparatus is used for cleaning metal castings or forgings where the shape of the objects precludes grinding. The work is done in an enclosed booth, or the operator is protected by a mask or respirator. Steel shot or steel grit is extensively employed in-



with a spout and a valve actuated by a lever. The spout delivers the sand on to the rail just in front of a driving wheel.

Sand-box Tree or **MONKEY'S DINNER-BELL** (*Hura crepitans*). Evergreen tree of the family Euphorbiaceae. A native of tropical America, it grows to a height of about 40 ft. and has glossy,



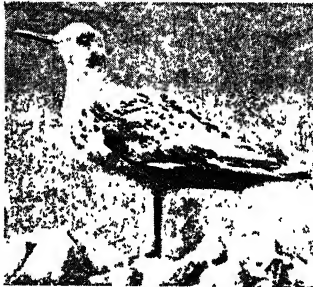
Sand-box Tree. Leaves and flower spike; inset, unripe fruit from which boxes for blotting-sand were made

heart-shaped leaves. The small, inconspicuous, reddish flowers are succeeded by a large fruit, the size of an orange, but compressed above and below, with rounded ribs. When dry these ribs split with a loud report, to release the seeds, the name Monkey's Dinner-bell

or Sandemanians. His main contention was that faith is a simple assent to the Divine testimony concerning Jesus Christ, in no way differing essentially from belief in human testimony. After officiating as minister in Perth, Dundee, Edinburgh, and London, he crossed the Atlantic in 1764, and founded a church at Portsmouth, New Hampshire, in 1765. He died April 2, 1771.

San - de - Pu or HEIKOUTAI, BATTLE OF. Fought between the Russians and the Japanese, Jan. 26-27, 1905. After the battle of the Sha-ho, both sides had reorganized for the further contest, but the fall of Port Arthur, Jan. 2, 1905, made it necessary for Kuropatkin to attempt to strike the Japanese before they were reinforced. The Japanese resistance was superb, and Oyama immediately prepared a counter-attack, and the Russians decided to withdraw. The Russians lost about 10,000 men, to 8,000 Japanese casualties.

Sanderling (*Crocethia alba*). Shore bird, related to the plover. It is about 8 ins. long, and has



Sanderling. Migratory bird found by the sea and on the shores of lakes
W. S. Berridge, F.Z.S.

brown and grey plumage on the upper parts, with white beneath, and a long and straight beak. It is a migratory bird, arriving in Great Britain in Aug., and leaving about April, but breeding farther N.

Sand Fly. For details of the insect sometimes given this name see Moth-Flies.

Sandford and Merton. Moral story for the young, by Thomas Day. It was first published, anonymously, as The History of Sandford and Merton, 3 vols., 1783-89. It contrasts the pampered selfish



Sand Grouse. Specimen of Pallas's sand grouse
From the Cambridge Natural History (Macmillan).

boy, Tommy Merton, with the healthy, unselfish Harry Sandford. Their tutor, Mr. Barlow, never loses any opportunity of improving the occasion with appropriate moralising. The book long enjoyed popularity among parents and teachers, if not among children.

Sanderson, FREDERICK WILLIAM (1857-1922). British schoolmaster. Born May 13, 1857, he was educated at Durham university and Christ's College, Cambridge. Having been mathematical lecturer at Girton, 1882-85, and assistant master at Dulwich from 1885, he was in 1892 appointed headmaster of Oundle. There he did much for education by innovations in both the curriculum and methods of teaching. He laid particular stress on practical engineering and scientific work, even for classical students, and raised Oundle high among British public schools. He died, following a collapse on the platform at a public meeting, June 15, 1922. H. G. Wells, one of his greatest admirers (Wells's own sons were at Oundle under Sanderson), wrote a biography of Sanderson, The Story of a Great Schoolmaster, 1924.

Sandgate. Urban dist. of Kent, England. It is 2 m. by rly. W. of Folkestone. The castle, built by Henry VIII in 1539, and restored in 1806, formerly one of the coast defences, is now a museum. The church of S. Paul is a modern building of debased Gothic architecture. Close by is Shorncliffe Camp. Considerable damage was done by a landslide at Sandgate in 1893. The climate is generally milder than that of many S. coast resorts, and sufferers from pulmonary complaints derive benefit from it. Pop. est. 3,000.

Sand Grouse. Game bird of the family Pterocletidae, related to the pigeon. Occurring in Africa, in

Central and S. Asia, and occasionally in Europe, the best known species is Pallas's sand grouse (*Syrhaptes paradoxus*), which visited Great Britain in considerable numbers in 1863 and 1888. The plumage is buff, grey, and black, and is well adapted to make the bird inconspicuous in its native haunts. It travels in flocks, and feeds upon insects and vegetable matter.

Sand Hopper (*Talitrus locusta*). An amphipod crustacean, which swarms in the sand between tide marks, and may usually be found under decaying animal matter. It is dirty white in colour. When



Sand Hopper. The crustacean which acts as a shore scavenger at low tide

alarmed it burrows rapidly in the sand. It serves a useful purpose as a scavenger of the shore.

Sandhurst. Village of Berks, England. It is 33 m. S.W. of London and 4½ m. S.S.E. of Wokingham, where is the nearest rly. station. Its chief interest is the Royal Military Academy (*q.v.*), formerly called the Royal Military College, for the training of army officers.

Sandhurst. City of Australia, in Victoria, officially known as Bendigo (*q.v.*).

San Diego. City of California, U.S.A., the co. seat of San Diego co. A port of entry on San Diego Bay, it is 126 m. S.S.E. of Los Angeles, and is served by the Atchison, Topeka, and Santa F^e, and other rlys. San Diego Bay forms a secure and commodious harbour. The city is favoured as a watering-place, and has a military and naval academy, a Carnegie library, and nearly 2,000 acres of public parks. Some 10 p.c. of all retired U.S. naval officers live there. Except for



Sandhurst, Berkshire. Buildings of the Royal Military Academy, where officers are trained for the British army



San Diego, California, U.S.A. Air view of the city showing the civic centre and port

a single large-scale aircraft plant, the city's 335 factories are mostly small. Pop. 203,341.

Sandila. Town of the Uttar union, India, in Hardoi dist. It is situated near the S. border of the dist., on the rly. between Hardoi and Lucknow. 34 m. S.E. of Hardoi. Pop. 18,400.

Sanding Machines. Machines by which the surface of wood is cleaned and finished, the abrasive being sand or other sharp material cemented to cloth or paper. The abrasive is attached to a moving belt, or to a revolving disk or drum, against which the surface of the article is pressed. Smaller sanders are electrically operated; one type has a flexible disk bearing the abrasive paper or cloth, and can be used for sanding flat or curved surfaces; another has an endless belt bearing the sandpaper and travelling between two pulleys. Both these machines are pressed down on to the article to be cleaned or finished. A sanding disk can be used with portable electric drilling machines.

Sand Launce OR **SAND EEL** (*Ammodytes*). Genus of small carnivorous fishes of the family

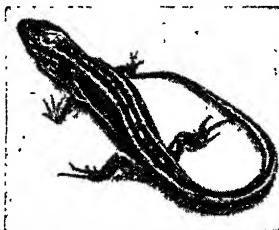


Sand Launce. Fish resembling an eel, that buries itself in wet sand

Ammodytidae. They have long bodies with a dorsal fin extending nearly the whole length of the back and a pointed head with protruding lower jaw. They frequent sandy shores, and swim near the

surface of the water. When the tide is out they bury themselves in the sand. They feed chiefly upon small sprats and the fry of other fish; and are themselves much in demand as bait for anglers. Great Britain has two species, varying in length from 6 to 18 ins.

Sand Lizard (*Lacerta agilis*). British lizard. The average size of the male is $7\frac{1}{2}$ ins., the female a



Sand Lizard. Small reptile that lives in sandy districts
W. S. Derridge, F.Z.S.

little larger. The male is a pronounced green colour, the female brown and grey, and they affect sandy districts. The eggs are laid in the sand, and are hatched by the sun. See Lizard.

Sandomierz OR **SANDÓMER**. Town of Poland. It is 50 m. S.W. of Lublin. The town crowns a lofty bluff on the left bank of the Vistula, a few miles above the confluence with the navigable river San, and was before the First Great War a frontier town on the border of Austria with Russian Poland. It has rly. connexions with Lodz and Warsaw and, less directly, with Lublin. It is the seat of a R.C. bishop. The chief industries are brewing, tanning, and the cultivation of fruit. Sandomierz was a residence of the Polish kings, and here a union (*consensus*) of Polish Protestants

was formed in 1570. Sandomierz figured in battles of 1914-15 on the river San (*q.v.*).

During the Second Great War the Germans captured Sandomierz Sept. 8, 1939. Under the Russo-German partition of Poland, it remained in German occupation. The 1st Ukrainian army, widening a bridgehead at the W. of the Vistula, carried Sandomierz by assault Aug. 18, 1944. From Baranov in this bridgehead and a little to the W. of Sandomierz, the same army advanced Jan. 12, 1945, to take Kielce, Jan. 15.

San Domingo. Former name of the capital of the Dominican Republic. The city is described under Ciudad Trujillo.

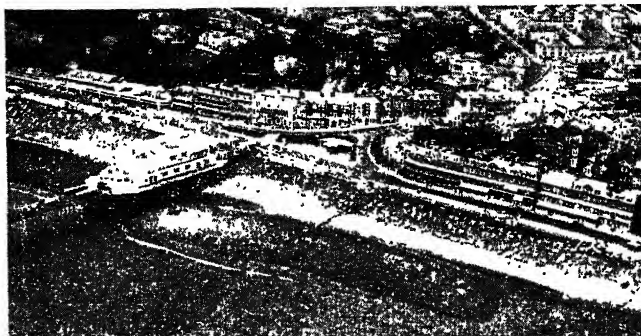
Sandow, **EUGEN** (1867-1925). Wrestler and physical culturist. Born at Königsberg, April 2, 1867, he was educated at the university of Göttingen, and at an early age acquired a reputation as an amateur gymnast and wrestler. Proceeding to Brussels, he toured Holland before coming to England to secure an engagement at the Crystal Palace. His crowning achievement as a wrestler, however, was his defeat of his former adversary, the Italian Sali, and two others, who were permitted to attack him simultaneously.



Eugen Sandow, physical culturist

Proceeding to London again, he secured the £100 offered by Samson, the "strongest man in the world," to anyone performing the weight-lifting feats of Frank Cyclops, his pupil, and shortly after in the Aquarium, Westminster, successfully repeated the feats performed by Samson himself. On Jan. 28, 1891, he defeated Hercules in a weight-lifting contest, and was awarded the world's championship belt. In 1897 he wrote *Strength and How to Obtain It*, revised edition, 1911, and in 1898 founded a magazine, *Physical Culture*. He died Oct. 14, 1925. Consult *Sandow* the Magnificent, C. T. Trevor, 1946.

Sandoway. Dist. and town of Burma, in the Arakan div. The dist. has a long coastline on the Bay of Bengal, and an excessive rainfall of 208 ins. Rice is grown, but only $\frac{1}{4}$ p.c. of the area is cultivable. The town is almost the mid-point of the coast of the dist. Area 3,784 sq. m. Pop., dist., 139,747; town, 5,500.



Sandown, Isle of Wight. An air view of the sea front and parade looking north-west

Sandown. An urban dist. and watering-place of the Isle of Wight. It stands on Sandown Bay, an opening of the S.E. coast of the island, 6 m. S. of Ryde, with a rly. station. It has a fine, sandy beach, pier, good bathing, and golf links. Pop. 7,000.

Sandown Park. Racecourse in Surrey, England. It is 15 m. S.W. of London, near Esher rly. station. The July meeting is one of the most celebrated of the British racing season, the principal race being the valuable Eclipse Stakes, run over $1\frac{1}{4}$ m.

Sandpaper. Stout and durable paper to which crushed sand is stuck; it is used for cleaning and smoothing wood, paintwork, etc. The sand is graded, and sandpaper is prepared in various types. See Emery; Glass Paper; Polish.

Sand Pipe. Name given to certain tubular or funnel-shaped formations in chalk caused by the solvent action of rain water. These pipes are generally filled with sand, gravel, or earth, reach a depth of 40-50 ft., and may be ten or more feet diameter.

Sandpiper. Group of migratory birds, related to the plover. The common sandpiper (*Actitis hypoleucos*) is about eight ins. long, and has olive-brown upper parts, white chin, ash-coloured breast, and white under parts. It is often known as the summer snipe,

and is not uncommon about streams between April and Sept., especially in the wilder parts of Scotland. It nests in hollows beside streams. The green sandpiper (*Tringa ochropus*) is rather larger, and has a greenish tinge on the olive-brown plumage of the upper parts. It breeds in N. Europe, and usually visits Great Britain later.

The purple sandpiper (*Calidris maritima*) is found about the coasts of Great Britain during the autumn and winter, and has blackish upper parts with purple reflections. The curlew sandpiper (*C. testacea*) has a curved beak like a curlew, and occurs in the migrating season on the E. coast of Great Britain. The wood sandpiper (*T. glareola*), which closely resembles the green sandpiper, is found in autumn on the E. and S. coasts.

Sandringham. Parish and village of Norfolk. It is 6 m. N.E. of King's Lynn, 2 m. E. of Wolferton. Sandringham House, built 1869-71 by Edward VII, when prince of Wales, was a favourite residence of reigning monarchs. A building of red brick in the Elizabethan style, it stands in a picturesque park of 200 acres. It was considerably damaged by fire in 1891. George V died at Sandringham, where for several years he had given his Christmas broadcasts. There was for long a tradition that the clocks at Sandringham House were kept permanently half an hour fast; the first act of Edward VIII on his accession was to make the clocks correct. At the home farm agricultural experiments have been carried out, e.g., flax-growing. Pop. est. 200. *Consult* Sandringham Past and Present, Mrs. C. Rachel Jones, 1883.

Sandringham. A town in Bourke co., Victoria, Australia. Situated 11 m. by rly. S. of Melbourne on the shores of Port Phillip, it is a residential suburb of the capital. Pop. est. 3,000.

Sandstone. In geology, name given to strata of compacted sand. The binding materials of sandstones are usually lime carbonate, iron oxide, or silica. According to the size of the sand grains sandstones grade insensibly from conglomerates to shales. Grits are coarse-grained rocks like sandstones, but the grains are sharp and angular.

Sandstones occur in all geological formations, and deposits vary from a few inches up to many hundreds of feet in thickness. They make excellent building stones and road-making materials. The Devonshire bats, as the sandstones from the Blackdown Hills are called, make first-class grindstones, as do the Craigleith stones quarried near Edinburgh, the sandstones of Newcastle and Bilston, the Berea sandstones of Ohio, U.S.A., etc.

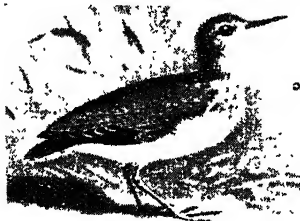
Sandstorm. Desert storm in which large quantities of coarse sand are carried by the wind relatively close to the ground. Although the sand particles are rarely raised beyond 100 ft. (and are not carried far from their source), the finer dust particles may reach greater heights. One type of sandstorm is caused by a strong current of air blowing steadily in a constant direction, facilitating the formation of sand dunes. Another consists of a



Sandringham House, Norfolk. Private country residence of the British Sovereign.

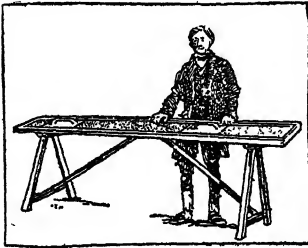
cyclonic swirl of wind which sweeps up the sand into a great pillar of cupola-shaped masses and frequently causes much destruction. The simoom, the sand-storm of the African and Arabian deserts, has a narrow track and passes in a few minutes. See Dust-storm.

Sand-table. Ledged board holding a layer of sand, used for elementary lessons in reading, writing, and arithmetic. The



Sandpiper. Common sandpiper or summer snipe

system, based on native Indian practice, was employed by Joseph Lancaster. In his Borough Road



Sand-table, on which children learned to write, at Dennington, Suffolk
From a drawing by C. G. Harper

school, in London, sand-trays covering long desks enabled 50 scholars to write with the fore-finger at the same time. The letters and figures, about 3 ins. long, were effaced by shaking, or by levelling with wooden rollers; writing sticks were sometimes used.

Sandur. Mahratta-ruled state of the Bellary district of Madras, India. It comprises a valley between two hills. Near Ramandrug manganese is mined. Food grains are the chief crops. In 1933 the ruler decreed that all temples, wells, and schools should be thrown open to the depressed classes. Its area is 167 sq. m. It acceded to the dominion of India in 1947. Pop. 15,000.

Sandusky. City of Ohio, U.S.A., the co. seat of Erie co. A port of entry on Sandusky Bay, an arm of Lake Erie, it is 50 m. by rly. S.S.E. of Toledo, and is served by the Baltimore and Ohio and other rlys. Sandusky Bay, 15 m. long and 5 m. broad, forms an excellent harbour. It has a state fish hatchery. The industries include the making of chemicals, paper, motor engines, glass, agricultural implements, and lumber products, and a trade in fruit and coal. It has retained its early pre-eminence as a grain-shipping centre.

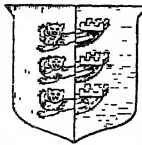
Owing to its position Sandusky was a trading station early in the 18th century. The English had a fort here during the Seven Years' War; but in 1763 it was destroyed by the Indians. After the independence of the U.S.A. it was rebuilt, and during the war of 1812-13 it was assailed by the British. The attempt to capture it, however (Aug. 22, 1813), was a failure. The present settlement dates from 1817, and Sandusky was made a city in 1845. Pop. 24,874.

Sandwich. Name for an article of food consisting of two slices of bread between which ham or meat of other kind, fish, or some other

food, sweet or savoury, is placed. The name is said to be due to the 4th earl of Sandwich (d. 1792), who had food of this kind provided for him when gaming, in order that he might continue at play for long periods.

Sandwich. Mun. borough, market town, and one of the Cinque Ports of Kent, England. On the right bank of the Stour, 2 m. from the sea and 13 from Dover, it has a rly. station. The chief buildings are the guildhall, S. Clement's church, with its Norman tower, S. Peter's church, S. Mary's church, S. Bartholomew's hospital, with its beautiful Early English chapel, and S. Thomas's hospital. Fisher Gate and the Barbican remain of the town's fortifications. The grammar school is an old foundation in modern buildings. There are a number of old houses, and some streets retain their mediæval appearance. Promenades occupy the site of the town walls. The golf links, both the Prince's and the Royal S. George's, are among the most noted in the country. Sandwich, owing to its position, was one of the chief English ports for some centuries after about 1000, but it began to decay owing to the gradual closing in the 16th century of the channel on which it stood. Until 1885 it was separately represented in parliament. About a mile away is Richborough (q.v.). Market day, Tues. Pop. 3,800.

Sandwich, EDWARD MONTAGU, 1ST EARL OF (1625-72). English sailor. Born July 27, 1625, he sided as a young man against his family, staunch Royalists, and fought for the parliament at Marston Moor and Naseby. M.P. for Huntingdonshire in 1645, he retired from politics 1648-53, becoming a commissioner of the Admiralty, and hoisting his flag as part commander with Blake three years later. One of Cromwell's new peers, on the death of the Protector and the abdication of Richard he took the fleet over to the side of Charles, and brought the prince to England. Created earl of Sandwich in 1660, Montagu distinguished himself in the Dutch war of 1664-65, and was ambassador to Spain, 1666-68. Returning to take part in the second Dutch war, he was killed in his victory of Southwold Bay, May 28, 1672.



Sandwich arms

The title of earl of Sandwich passed to his eldest son Edward, while another Edward (d. 1729) was the 3rd earl. John Montagu, who became the 4th earl on his grandfather's death in 1729, was the father of John, the 5th earl (d. 1814), from whom the present holder, the 9th earl (b. Dec. 29, 1874), is descended. The earl's eldest son is known as Viscount Hinchingbrooke.

Sandwich, JOHN MONTAGU, 4TH EARL OF (1718-92). British politician. Born Nov. 3, 1718, he became earl in 1729. Educated at Eton and Trinity College, Cam-



Sandwich. The north gate or Barbican of the old Kentish Cinque port. It is a relic of the ancient fortifications

bridge, he became associated with the duke of Bedford, and his first important public work was helping to arrange the peace of 1748. During 1748-51 he was first lord of the Admiralty, and during 1763-65 was a principal secretary of state. Having been postmaster-general, he was again secretary of state, 1770-71, and first lord of the Admiralty, 1771-82. The earl, who gave his name to the Sandwich Islands (as well as to the sandwich), let the navy fall into a corrupt and deplorable condition. An associate of Wilkes, and a member of the Hell-fire Club, he won, when he took part in prosecuting Wilkes, the name of Jemmy Twitcher. He died April 30, 1792. Basil Montagu the writer was a natural son of the earl.

Sandwich Islands. A name for the Hawaiian Islands (q.v.).

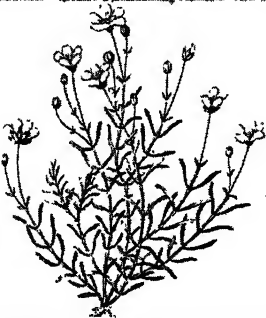


1st Earl of Sandwich,
English sailor
After Lely

Sandwichman. Name applied to men who parade the streets bearing two boards, one in front and one behind, on which are displayed advertisements. A common form of publicity in the 19th century, the sandwichman, sometimes dressed in appropriate costume, was later used chiefly for advertising entertainments and political meetings. During and after the Second Great War the sandwichman almost disappeared.

Sandwip. Island of E. Bengal, Pakistan. It is the most S. island of the easternmost channel of the Ganges-Brahmaputra delta, and is separated from Chittagong by Sandwip Channel. In 1876, 40,000 people, it was estimated, lost their lives here from a tidal inundation during a great storm. Like the neighbouring islands and the Sundarbans, Sandwip is a low-lying alluvial tract. In the 16th century it was a great port with a large trade in salt and timber; in the first half of the 17th century it was a pirate stronghold, first for Portuguese under Gonzales, and then for Arakanese, who were dispersed in 1665. Descendants of Portuguese pirates have adopted the local dress, customs, and language. The E. India Co. came on the scene in 1756. Area, 167 sq. m. Pop. 178,185.

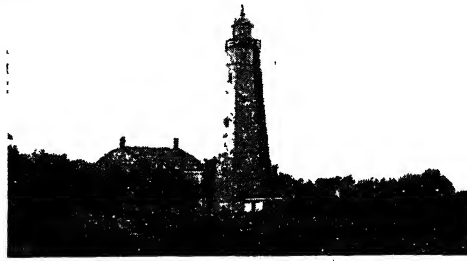
Sandwort (*Arenaria*). Genus of annual and perennial herbs of the family *Carvophyllaceae*. They



Sandwort. Foliage and flower-heads of *Arenaria bavarica*

are natives of temperate and cold regions. They have slender, jointed stems, swollen at the nodes, where the pairs of broad or narrow stalkless leaves arise. The flowers are small and of regular form, in loose, forking clusters, mostly white—a few rosy or purple.

Sandy. Parish and village of Bedfordshire, England. Standing on the little river Ivel, 7 m. E. of Bedford, and on the rly. and the Great North Road, it is the centre for the agricultural produce of the



Sandy Hook, New Jersey. Lighthouse, built in 1784, one of the oldest in the U.S.A.

neighbourhood. Sandy is said to be the Salinae of the Romans, and in the vicinity are two ancient Roman camps, of which Caesar's Camp covers an area of 30 acres. Evidences of Roman occupation have been excavated. Pop. 3,140.

Sandy Hook. Narrow sandy peninsula of New Jersey, U.S.A. Stretching N. for 6 m., and partly enclosing New York Lower Bay, it has a lighthouse, 90 ft. high, state ordnance proving grounds, and a fort. The America's Cup course lay off Sandy Hook. See New York.

Sandys, EDWIN (c. 1516-88). English prelate. He was born at Hawkshead, Lancs, and was educated at S. John's College, Cambridge, becoming master of S. Catharine's Hall in 1547, and vice-chancellor in 1553. For supporting Lady Jane Grey he was imprisoned in the Tower of London. On his release he fled to Flanders, where he remained till the accession of Elizabeth. He was then appointed bishop of Worcester in 1559, bishop of London in 1570, and archbishop of York in 1575. He helped to prepare the Bishops' Bible in 1565, and was a supporter of the Puritan party. Archbishop Sandys died July 10, 1588.

Pron. Sands.

Sandys, FREDERICK (1832-1904). British artist. He was born at Norwich, May 1, 1832, and in art was mainly self-taught. Working on Pre-Raphaelite lines, he exhibited many notable portraits at the R.A., though all his life he was in opposition to that

body, and he was one of the brilliant artists who revived English illustration in the 'sixties and 'seventies. He died at Kensington, June 25, 1904.

Sandys, SIR JOHN EDWIN (1844-1922). British scholar. Born May 19, 1844, he was educated at

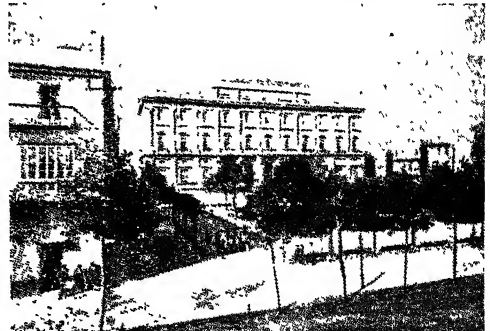
Repton and S. John's College, Cambridge, of which he was tutor 1870-1900. He was public orator in the university, 1876-1919, and was knighted 1911. Editor of many Greek and Latin texts, his reputation will rest largely upon his *History of Classical Scholarship*, 1903-08, a comprehensive study in 3 vols. He died July 6, 1922. A *Life*, by N. G. L. Hammond, appeared in 1933.

San Felipe. Town of Chile, capital of the prov. of Aconcagua. It stands in a valley at the base of the extinct volcano Aconcagua, on the Trans-Andean rly., 55 m. E. of Valparaiso. It is connected by motor road with Santiago, 41 m. away. Pop. est. 20,000.

San Felipe. Town of Venezuela, capital of the state of Yaracuy. It is situated on a branch rly. 26 m. from the main line from Tucacas to Barquisimeto, and 40 m. W.N.W. of Valencia, in a valley which produces coffee, sugar, cacao, cereals, tobacco, and fruit. Pop. est. 10,000.

San Felú de Guixols. Seaport of Spain, in the prov. of Gerona. Situated on the Mediterranean, 25 m. by rly. E.S.E. of Gerona, the town is now the chief port for the Spanish cork industry. Pop. 12,800.

San Fernando. Seaport of Spain, in the prov. of Cadiz. It stands on the rocky island called



San Fernando, Spain. Law courts and principal square

Isle de Léon (which name the town bore until 1813), in the Bay of Cadiz, $4\frac{1}{2}$ m. S.E. of Cadiz. One of the three chief naval ports of Spain, it has an arsenal and naval workshops and academy. The industries include the manufacture of salt, ropes, sails, and soap. Near the town are an astronomical observatory, a Roman bridge, and the site of the temple of the Tyrian Hercules. Pop. 36,000.

San Francisco. Highest mt. in Arizona, U.S.A. Situated on a plateau, 5,000 ft. high, in the N. central part of the state, it is of volcanic formation and reaches 12,795 ft. Extinct volcanic cones lie around it.

San Francisco. Chief commercial city of the Pacific states of the U.S.A. It stands on San Francisco Bay, in California. Though the gate to the western ocean, the city faces E., turning its back on the Pacific and looking across San Francisco Bay. This landlocked sheet of water, 50 m. long and 5 m. broad, has access to the ocean only through a strait, 5 m. long and a mile wide, the far-famed Golden Gate. The city stands on the peninsula to the S. of this and is built on the E. slope of a semicircle of hills. Below the twin peaks of Las Papas stands the Mission Dolores, built in 1778, a relic of the old Spanish days.

Four cities E. of the bay—Alameda, Berkeley, Oakland, Richmond—are satellite ports. Some 20 shipping lines have their headquarters at San Francisco, with 16 m. of berthing space. Golden Gate Bridge has the longest single span in the world, 4,200 ft. Bay Bridge takes annually 24 million vehicles and 50 million passengers on trains.

Market Street, starting from the Ferry Building and running due S.W. for 3 m., is the main business thoroughfare of San Francisco. It is 120 ft. wide and is bordered on either side by a skyline of tall buildings and hills. Telegraph Hill rises abruptly 300 ft. Nob Hill, named from the early "nabob" millionaires, is covered with marble and stone buildings of the early residents.

The city, "born of the meeting of sea captains and gold seekers, is extraordinarily cosmopolitan, having the largest Chinese colony outside the Orient and a densely peopled Latin quarter. Chinatown is near Nob Hill, and has virtually its own administration, with shops, postal service, journals, etc. Until 1942 the Japanese colony equalled the Chinese in numbers. With its

banishment the city lost its skilled market gardeners.

The U.S. branch mint is a massive building of classical design. Some of the most impressive offices are those of newspapers. Hotels are prominent in the business district, and the Fairmont boasts a splendid view over the bay. It stands on Nob Hill, once the best residential quarter, and opposite to it is the institute of the San Francisco Art Association.

In Pacific Street is "Barbary Coast," the region of dance halls, saloons, and wild amusement, frequented by sailors from the extraordinarily varied shipping of San Francisco. Mingled with the shipping are the fishing boats and

collection of British parliamentary papers. In the Ferry Building is a fine museum of mining and in Golden Gate Park is another museum devoted to natural history, ethnology, and botany. The most important manufacturing establishment is the Union Iron Works, where many warships have been built.

Spanish soldiers and missionaries were the first settlers on the peninsula, in 1776, but in 1846 the United States flag was hoisted. Two years later gold was discovered and the great rush followed, raising the population in a year from 900 to 20,000. Hordes of reckless characters were attracted by the prospect of sudden riches, and for



San Francisco. Plan of the chief commercial city in the Pacific states of America

coasting craft from which the fruit and vegetable markets draw their supplies. The Presidio, situated at the end of the peninsula, was built as, and still is, a military post, and its guns, the complement of those on the opposite cliff of the Golden Gate, make the entrance to the harbour impregnable. But the reservation of 1,500 acres is laid out as a park open to the citizens. It is surpassed by Golden Gate Park of 1,014 acres, which runs over the heights to the Pacific. With its semi-tropical vegetation, Stow Lake, and Strawberry Hill, this is full of beauty, and it leads to Sutra Heights, where the Cliff House, overlooking the Seal Rocks and their hundreds of sea-lions, stands on the very verge of the western world.

The public library of the city is remarkable for its collection of 16th century literature and Macaulay's

some years life in San Francisco was as wild and dangerous as in any other mining camp; but in 1856 the vigilance committee enforced order with severity and established decent government.

On April 18-19, 1906, came the great earthquake, followed by a three-day fire, in which 452 persons were killed, 2,000 acres devastated and nearly 500,000,000 dollars' worth of property was destroyed. Undaunted, the people of San Francisco, by replacing the old wooden houses with brick or concrete structures, improved their city. It is governed by a mayor and a board of supervisors, and its citizens can take a share in public affairs by referendum and recall. Pop. est. 634,536. *See* Bridge illus. p. 1424; Earthquake illus. p. 2903. *Consult* Golden Gate, F. Riessenberg, 1942; Golden Gate Country, G. Atherton. 1945.

San Francisco Bay. Deep indentation of the coast of California, U.S.A., forming the harbour of San Francisco. It is a land-locked bay, stretching S.E. for about 40 m. to 50 m., with a breadth varying from 5 m. to 12 m. The Golden Gate, a channel 5 m. long and from 1 m. to 2 m. broad, provides the entrance to the bay, which communicates N. with San Pablo Bay. See Bridge illus. p. 1424; California; Golden Gate.

San Francisco Conference. Meeting held at San Francisco April 25–June 25, 1945, at which the charter of the United Nations organization was drawn up. The conference was composed of delegations of 46 nations, joined later by four others, which had adhered to the United Nations' declaration embodying the Atlantic Charter and signed at Washington, Jan. 1, 1942, by 26 of them. Adherence to this declaration before March 1, 1945, which meant repudiation of Axis ties, was a condition of invitation laid down by the U.K., the U.S.A., and the U.S.S.R. at Yalta in Feb., 1945. The 50 nations which at San Francisco signed the charter on June 26, 1945, were: Argentina, Australia, Belgium, Bolivia, Brazil, Canada, Chile, China, Colombia, Costa Rica, Cuba, Czechoslovakia, Denmark, Dominican Republic, Ecuador, Egypt, Ethiopia (Abyssinia), France, Greece, Guatemala, Haiti, Honduras, India, Iran (Persia), Iraq, Lebanon, Liberia, Luxembourg, Mexico, Netherlands, New Zealand, Nicaragua, Norway, Panama, Paraguay, Peru, Philippines, Salvador, Saudi Arabia, S. Africa, Soviet Union, Syria, Turkey, Ukraine, U.K., U.S.A., Uruguay, Venezuela, White Russia, and Yugoslavia. A preparatory commission set up on June 26 made arrangements for the first meeting of the general assembly of the United Nations (*q.v.*) held in London Jan.–Feb., 1946.

Sangallo. Florentine family of architects. Giuliano da Sangallo (d.1516), architect and military engineer, studied under Francione, and was employed by Lorenzo the Magnificent to design various buildings, including a convent by the gate of San Gallo, Florence. Settling in Rome, he was patronised by the popes Alexander VI and Julius II, and became one of the founders of the Roman school of architecture. He returned to Florence to build fortresses for defence against Pisa, but in 1514 was made architect to S. Peter's in conjunction with Raphael.

His brother Antonio (1455–1534), also an architect and military engineer, built the fine church of S. Biagio, Montepulciano. Antonio the younger (1485–1546), nephew of Giuliano, studied under Bramante in Rome, where he designed the church of S. Maria di Loreto, and in part that of S. Giovanni dei Fiorentini.

Sangay. Volcano of Ecuador, in the Andes. It is situated near Riobamba, and in Chimborazo dept., is active and snow-covered, reaching an alt. of 17,390 ft.

Sanger, GEORGE (1827–1911). English showman, who called himself Lord George Sanger. He was



"Lord" George Sanger, circus proprietor

born at Newbury, Dec. 23, 1827, the son of a travelling showman. George led a wandering life with his parents, and at Stepney Fair in 1848 he met Nellie Chapman, then performing with Wombwell's lions, and married her in 1850. With his brother John (1816–89) he started in 1854 a travelling circus. One of his greatest successes was his spectacle of Mazeppa, the name part of which he impersonated over 9,000 times. In 1871 Sanger purchased Astley's amphitheatre and menagerie, and then leased the Agricultural Hall, Islington. Besides these, he ran circuses at Birmingham, Liverpool, Glasgow, Dundee, Aberdeen, Bath, Bristol, and Plymouth. He was shot dead by one of his employees, Nov. 28, 1911. His book, *Seventy Years a Showman*, was repr. 1926.

His son, George Sanger (1868–1947) carried on as circus proprietor, and contributed memoirs of famous shows to Sunday newspapers. He died Jan. 30, 1947.

Sanger, MARGARET. American protagonist of contraception. Born

at Corning, N.Y., she was educated at Claversack College, and trained as a nurse. Her chief claim to fame was that she originated the term birth control for contraception. She was arrested in 1916 for conducting a birth control clinic in Brooklyn. In 1921 she organized the first U.S. birth control conference, and in 1927 a world population conference at Geneva. She set up 50 teaching centres for birth control in India. Founder of the U.S. Birth Control League, in 1928 she formed a committee to press for federal legislation on the subject. Such legislation was achieved in 1937. Margaret Sanger, who was Mrs. J. H. N. Slee, published books, including her autobiography in 1938.

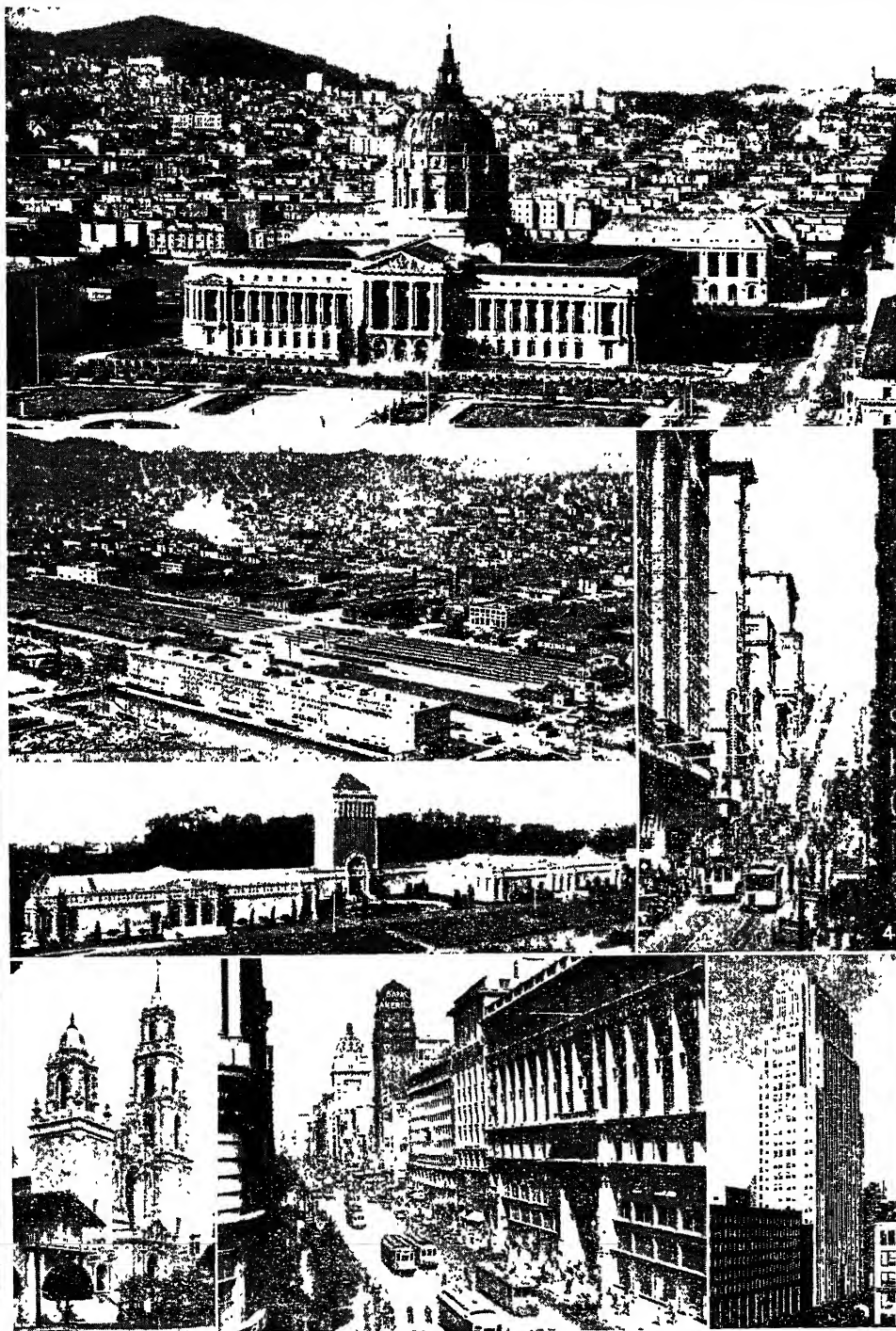
San German. Town of Puerto Rico, West Indies. Situated in the S.W. part of the island, 10 m. by rly. S.E. of Mayaguez, it has a large export trade in coffee, cocoa, fruit, tobacco, and sugar.

San Gil. Town of Colombia, in the dept. of Santander. It stands on the Gil river, 148 m. N.E. of Bogotá, and 65 m. S.S.W. of Pamplona. The manufactures include farming implements, tobacco, straw hats, cotton, sugar, and quinine. It has a large trade in the agricultural produce of the dist. Pop. approx. 12,000.

San Gimignano. City of Italy, in the prov. of Siena, commonly called in Italian "San Gimignano delle Belle Torri" (S. G. of the beautiful towers). It stands at an alt. of 1,100 ft., 22 m. N.W. of Siena. An old Tuscan city, its ancient walls, towers, and the Gothic architecture of many of its buildings preserve its medieval aspect. The former 12th century cathedral was rebuilt in the 15th, and contains many masterpieces and frescoes, the work of Ghirlandajo and Gozzoli, the latter being badly damaged by shrapnel in the Second Great War. The Palazzo Pubblico, built 1288–1323, had a museum containing many fine



San Gimignano, Italy. General view of this many-towered city



1. The Civic Centre, including the City Hall, in foreground, immediately behind which are the twin structures of the Opera House and the War Memorial. 2. Bird's-eye view of the quays. 3. De Young Museum in Golden Gate Park. 4. Some of the small cable cars

which climb Nob Hill and other steep streets of the city. 5. The ancient Mission Dolores nestling in the shadow of the parish church of the same name. 6. Market Street, the principal thoroughfare of the city. 7. Headquarters of Pacific Telephone and Telegraph Co.

SAN FRANCISCO: VIEWS OF THE OLDEST SEAPORT ON THE PACIFIC COAST OF N. AMERICA

paintings. The town was wantonly shelled by the Germans after they had withdrawn from it, and the French had taken it July 13, 1944, but was less badly damaged than was at first feared. All its 12 towers survived. A choice wine is produced from the vineyards of the surrounding dist.

Sangir, SANGUR, OR SANGI. Chain of islands in Indonesia. They lie in a north-easterly direction from Celebes towards Mindanao in the Philippine Islands, and are coral fringed. Of volcanic origin, the peak Abu on Sangi erupted in 1856, 1883, and 1892. The only settlement of importance is Taroena on Great Sangi Island. Cabinet woods, Manila hemp, coconuts, and nutmeg are the main products. Area, 408 sq. m. Pop. 134,930.

Sangli. Town and former state of India, in Bombay state. The state was the largest of the Southern Mahratta Jagirs, and lies E. of the W. Ghats, part being drained by the Kistna. Since 1948 it has been merged administratively in Bombay state, having acceded to the dominion of India in 1947. The town, 77 m. N.W. of Bijapur, is the terminus of a short branch rly. from Miraj. Area, 1,136 sq. m. Pop., state, 293,381; town, 21,112.

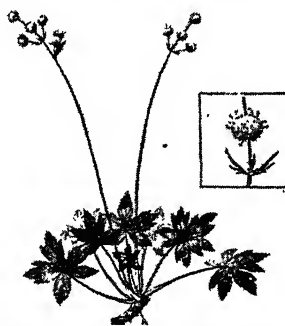
Sangre de Cristo. Mt. range in Colorado, U.S.A. A branch of the Rocky Mts., it has a mean alt. of about 12,500 ft., and reaches its culminating point in Blanca Peak, 14,390 ft. Several other peaks exceed 13,000 ft.

Sangro. River of Italy, in the prov. of Chieti. It rises near Palena, and runs generally N.W., reaching the Adriatic coast at Fossacesia. During the Italian campaign of the Second Great War the Allied 8th army was in control of 12 m. of the S. bank of the Sangro from its mouth by Nov. 20, 1943. But the Germans had destroyed all the bridges, and four days later, in heavy rain, British troops waded the swollen river, breast high, through a current running at 15 m.p.h., to secure a bridgehead 5 m. long and 1 m. deep on the N. bank. British and Indian sappers, working under fire, constructed three bridges, and on the night of Nov. 27-28 Gen. Montgomery was able to deliver an attack which dislodged the Germans from their intended winter line on the ridge overlooking the Sangro valley. This was the last battle in which Montgomery led the 8th army.

Sanhedrin (Gr. *synedrion*, council). Supreme council or senate of

the Jews. It had charge of all the internal affairs of the nation. Established apparently shortly before the time of Antiochus the Great, its exact origin is unknown, but it does not seem to have anything to do with the Mosaic council of seventy elders. It consisted of persons of the upper classes, seventy-one in number, who met under the presidency of the high priest. It acted as the supreme court of justice, with jurisdiction over Jews in all countries, and was allowed considerable freedom of action by both Greeks and Romans; but the power of inflicting the death penalty was taken from it about forty years before the destruction of Jerusalem. See Jews.

Sanicle (*Sanicula europaea*). Perennial herb of the family Umbelliferae. A native of Europe,



Sanicle. Rootstock, leaves, and flower-heads; inset, umbel of flowers

Asia, and Africa, it has a stout, creeping rootstock, and long-stalked, glossy leaves, cut into five wedge-shaped lobes. The minute white or pink flowers are clustered in compound umbels about $\frac{3}{4}$ in. across. The leaves have a bitter taste, and were formerly held in high repute for their supposed healing virtues.

Sanidine. In geology, name of a variety of potash feldspar. Clear, glassy, with a tabular crystallisation, it is common in many volcanic rocks. See Feldspar.

Sanitary Authority. Body charged with the duty of enforcing the Public Health Acts in Great Britain. In a county borough outside London the authority is the council of the borough. In counties it is in part the county council and in part the council of a non-county borough, the urban district council, or the rural district council. In London the authorities are the L.C.C., the common council of the City of London, and the metropolitan borough councils. In ports special port health

authorities may be created by the minister of Health.

Sanitary Institute, ROYAL. British institute, founded 1876, to promote the study of sanitary science. Examinations in this subject and in other subjects relating to public health are held in London and provincial centres. The Parkes Museum, which is maintained by the Institute, contains an interesting collection of objects, models, and specimens pertaining to public health. An annual congress is held, and a journal is published bi-monthly. The address of the institute is 90, Buckingham Palace Road, London, S.W.1.

Sanitation (Lat. *sanitas*, health). Term for the processes needed to maintain conditions conducive to human health, and used in particular for the system of waterborne removal of excreta. In scattered rural communities earth closets are sanitary if their contents are buried, or better, composted with kitchen waste to be used subsequently as manure. Water from a well in such a community is wholesome, provided it is not polluted by seepage from a farmyard or other source of contamination. With the installation of a piped water supply and waterborne sewerage, sanitation becomes more complicated, even in a country district. Waste water must be discharged in such a way that it cannot contaminate the water supply. Bath water can be run out over ground, e.g. in a garden, which will absorb it. Discharge from sinks and w.c.s. can be run into cesspools which must be emptied periodically, or, if there is land available to absorb its effluent, into a septic tank. Individual owners can do what is required, subject to by-laws, rules, or regulations in force in their locality.

In areas of any density of pop. wells and septic tanks are impossible. Water must be brought in from an outside source, and sewage and refuse must be removed outside the community area before they can be disposed of. This involves the installation of public utility services, either by a water undertaking or by the local authority. But the individual owner remains responsible within his own establishment. All his private installations must comply with standards laid down for the community as a whole, and the larger the community the more strict should be the com-

pliance, for failure to comply endangers a greater number of people. An insanitary solitary cottage may damage the health of one family; an insanitary tenement in a crowded street may lead to damage to the health of thousands. House pipes and fittings must be such that foreign matter cannot enter them. All pipes and fittings used for draining w.c.s, sinks, and baths should be such that, if gas forms in the connecting or main sewer (it never should if the sewers are properly ventilated), it cannot make its way back into the house. If there is no garden in which it can be used as compost, kitchen waste must be put in suitable refuse bins to be cleared by the local authority.

The local authority must maintain an adequate supply of water which must not be corrosive or liable to fur pipes and boilers, and must be chemically and bacteriologically fit for human consumption. The standard of purity is determined by the presence or absence of the common bacillus coli. The coli bacilli are harder than the pathogenic germs, and it is almost certain that if bacillus coli is absent the more vulnerable pathogenic germs will not be present. Coli and pathogenic germs are neutralised by some sterilising agent, of which chlorine is the simplest, though if used in any quantity it gives the water a nasty taste. Ozone is pleasant but more expensive. Excess lime is convenient with a hard water as it softens and sterilises at the same time. The local authority must remove sewage sufficiently rapidly to prevent it from causing bad smells, and must see to its disposal, or, better, its utilisation: sewage sludge and refuse composted together form a manure welcome to farmers.

Sanjak OR **SANYAT** (Turkish, standard). Name given to an administrative subdivision of the former Turkish empire. The empire was divided into vilayets or governments, each under a vali or governor-general. Each vilayet was subdivided into sanjaks, over which supervision was exercised by inferior authorities responsible to the vali. A famous sanjak was that of Novi Pazar, Serbia.

San Joaquin. River of California, U.S.A. Rising in the Sierra Nevada, to the S. of the Yosemite National Park, it follows a S.W. and N.W. course to Suisun Bay, which it enters close to the mouth of the Sacramento river. It is about 350 m. long, and navigable

to Stockton, 50 m. up. The valley yields grain and fruit. The huge Friant Dam in Fresno co. impounds the river waters, which are carried by pipeline, with a capacity of 2,000,000 galls. a minute, to the Friant-Dern canal system. San Joaquin is also the name of a county of California.



San José, California, U.S.A. Court house and hall of records

San José. City of California, U.S.A., the co. seat of Santa Clara co. A popular health resort, it is 48 m. S.S.E. of San Francisco on the rly. It is the seat of the university of the Pacific, and contains the R.C. college of Notre Dame. San José lies in a fruit-growing region and has fruit canning and packing houses, and metal works. The mercury mine of New Almaden is reached by rly. from here. San José was founded by Spaniards in 1877, the first Californian town as distinct from forts and mission centres. It was the state capital, 1849-51. Pop. est. 80,495.

San José. Capital city of Costa Rica, Central America. It is situated in a depression of the central plateau, at an alt. of 3,860 ft., 16 m. by rly. W.N.W. of Cartago, the former capital, and is also connected by rly. with Puerto Limón on the Atlantic and with Punta Arenas on the Pacific. The buildings include a cathedral, library, museum, institute of physical geography, school of law, and one of the finest opera houses in America. Its former university is used as a museum. The bishop of San José is a suffragan of the archbishop of Guatemala. There are steam flour mills, foundries, and distilleries. La Sabana on the outskirts has an aerodrome and facilities for sports. Pop. 97,557. See Costa Rica.

San José. Seaport and airport of Guatemala, on the Pacific coast. It is the terminus of the transcontinental rly. from the Gulf of Honduras, 27 m. by rly. S. of Escuintla. The chief Guatemalan port on the Pacific, it has a harbour and pier, and is a port of call for liners. Pop. 10,800.

San José. Department of S. Uruguay, bordered on the S. by the Río de la Plata. The surface is

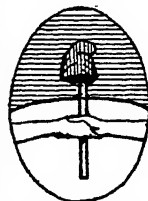
undulating, the soil fertile, and the inhabitants are mainly engaged in agriculture and rearing cattle and horses. Area, 2,688 sq. m. Pop. est. 97,687. The capital is San José, 46 m. by rly. N.N.W. of Montevideo. It carries on a trade in agricultural produce. Pop. 13,000.

San Juan. Range of mountains in Colorado, U.S.A. A branch of the Rocky Mts., they reach an alt. of 14,280 ft. in Mt. Wilson and Uncompahgre Peak, and contain rich deposits of silver.

San Juan. Prov. of W. Argentina. It is bounded N. and E. by the prov. of La Rioja, S.E. by San Luis, S. by Mendoza, W. by Chile. Mountainous in the centre and N., it has sandy plains and salt marshes in the E., while the Andes are on the W. border. The prov. is watered by the Río Blanco, Vermejo, and other streams, and stock breeding and agriculture are the chief occupations. Minerals abound, including gold, silver, copper, iron, malachite, and coal. The principal crops are wheat, alfalfa, maize, and grapes, and from the latter an excellent wine is made. Area, 34,432 sq. m. Pop. est. 243,303. The capital was San Juan, a well-built town 98 m. by rly. N. of Mendoza, but in Jan., 1944, it was destroyed by an earthquake.

San Juan. Seaport of Puerto Rico, capital of the island. A fortified city, dominated by a Morro castle, it stands on a small island off the N. coast, and is connected with the mainland by bridges and a causeway. It is the chief port and naval station on Puerto Rico, and its harbour is being improved. Among the prominent buildings are a cathedral, town hall, government offices etc. The university of Puerto Rico is established at Río Piedras, a few miles from the city. Sugar and coffee are exported. Founded by Ponce de León about 1511, it has several times repulsed British fleets. Its fortifications were bombarded by the U.S. naval forces under Admiral Sampson, May 12, 1898, seven months before Puerto Rico was ceded to the U.S.A. The water supply and sanitation were greatly improved under the American occupation. Pop. 222,839.

San Juan Bautista. City of Mexico, capital of the state of Tabasco. It stands on the river



San Juan arms

Grijalva, about 30 m. from the Gulf of Mexico. Manufactures include soap; candles, tiles, bricks, and cigars. Founded in 1598, it was called Villa Hermosa till 1821. Pop. est. 17,000.

San Juan del Norte OR GREYTOWN. Seaport of Nicaragua, Central America. It stands on the Atlantic coast, at the mouth of the navigable San Juan river, which separates Nicaragua from Costa Rica. The harbour is declining in importance, owing to deposits of silt, although a huge breakwater has been constructed to help to keep the waterways open. In spite of this, only small motor launches are able to enter. Mahogany, hides, rubber, bananas, tortoise-shell, and coconuts are exported. A wireless station has been established at the port. Pop. est. 1,000.

Sankey, JOHN SANKEY, 1st Viscount (1866-1948). British judge. Born Oct. 26, 1866, he was educated at Lancing, and



Viscount Sankey,
British lawyer
Russell

and Jesus College, Oxford. Called to the bar in 1892, he made a reputation as an ecclesiastical lawyer, and from 1909 to 1914 was chancellor of the diocese of Llandaff. Judge of the high court, 1914, when he was knighted, he presided over the commission of 1919 (often referred to as the Sankey commission), which inquired into the coal mining industry, and which recommended state ownership and management of the mines. He was a lord justice of appeal during 1928-29 and lord chancellor in the Labour government, 1929, a position he retained under the National govt. until 1935. Raised to the peerage in 1929, he was made viscount in 1932. He played a prominent part in the Indian round table conferences of 1930-31. He died Feb. 6, 1948.

Sankey, IRA DAVID (1840-1908). American evangelist. Born at Edinburgh, Penn., Aug. 28, 1840, he devoted himself to mission work and became famous through his association with D. L. Moody (q.v.), which began in 1870. The pair conducted revival services all over



Ira D. Sankey,
American evangelist

the U.S.A., and met also with great success in their visits to Great Britain in 1873-75, 1881-84, and 1891-92. Responsible for the musical part of the services, Sankey used his fine voice with great effect. He was the compiler of Sacred Songs and Solos, 1873, for which he composed a number of tunes, including the popular Ninety and Nine. In 1903 he became blind, and he died Aug. 14, 1908. Consult Sankey's autobiography, *My Life*, 1907.

Sankhya (Skt., enumeration). Brahmanic system of materialistic philosophy. Attributed to the sage Kapila, of unknown date, it was expounded later in the Sankhya sutra. It holds that a material first cause evolved into the phenomenal universe, through the interaction of the inherent qualities of matter. Souls, co-eternal with Nature, acquire attributes from matter, and retain them until they ultimately attain absolute unconsciousness.

Sankt Pölten. Town of Austria. It is on the river Traisen, 38 m. W. of Vienna. The medieval cathedral was rebuilt in the 18th century. Flour milling and the manufacture of cotton and iron goods, including firearms, are the principal industries. Pop. 38,759.

San Lorenzo. Seaport of Honduras, Central America. On the Pacific coast, it stands on the N. side of the Gulf of Fonseca, about 80 m. S. of Tegucigalpa. Amapala, on Tiger Island, is reached in three hours by motor-launch from San Lorenzo. There are also good motor-roads. Pop. est. 2,700.

San Lorenzo. Church in Florence. One of the oldest in Italy, the first church on the site was consecrated by S. Ambrose in 393. The present Early Renaissance building was begun under Brunelleschi in 1419, and consists of a nave, aisles, and transept. The roof and windows were somewhat damaged by shellfire during the Second Great War. The interior contains several striking pictures, and among others the tomb of Cosimo de' Medici, and the artist Donatello, who helped decorate the church. Adjoining the church is the library with some 10,000 Greek and Latin MSS. In the New Sacristy, built to designs by Michelangelo, 1520-24, is the Medici mausoleum, containing the monument of Giuliano and Lorenzo. The sarcophagus of the former is adorned with statues of Day and Night, which inspired Swinburne's sonnet, *In San Lorenzo*. Leading out of the sacristy is the chapel of the princes, where

later grand dukes of the Medicifamily were buried. See Michelangelo.

San Lorenzo FUORI LE MURA. One of the principal churches in Rome. The original church, founded by Constantine over the graves of SS. Lawrence and Cyriaca, was rebuilt by Pope Pelagius II in 578, and Honorius III made further important additions and alterations early in the 13th century. Subsequent popes restored and altered the church, Pius IX adorning the façade with paintings. The interior has been much restored and changed. The old church of Pelagius was excavated at the east side of the present building in 1870, and contains some restored mosaics of the 6th century. In the vestibule of this old church is the tomb of Pius IX.

Sanlúcar de Barrameda. Seaport of Spain, in the prov. of Cadiz. It stands on the left bank of the Guadalquivir estuary, 15½ m. by rly. N.W. of Jerez, and 26 m. by sea N. of Cadiz. An ancient city, probably of Phoenician origin, it is protected by forts, has many villas among the surrounding pine woods and vineyards, and is a summer bathing resort. The old, or higher town, has a ruined Moorish castle, and there are a 14th century church, a palace of the dukes of Medina-Sidonia, and a 16th century hospital for British sailors, founded by Henry VIII. Captured from the Moors in 1264, it became, after 1492, a great centre of trade with America. Columbus sailed hence in 1498, on his third voyage of discovery, and Magellan embarked here in 1519 on his voyage round the world. Sherry is made, and salt, cereals, and fruit exported. About 2 m. to the N. lies Bonanza, a shipping and fishing river port. Pop. 29,000.

San Luis. Prov. of central Argentina. It lies between the prov. of Mendoza, on the W., where



San Luis arms

the rivers Desaguadero and Salado form its boundary, and Córdoba on the E. Mountains in the N., where it is traversed by the Sierra de San Luis (alt. 7,000 ft.), the remainder is of a steppe-like character. It is sparsely watered, and agriculture depends to a large extent on irrigation. Stock-rearing is the chief occupation; vegetables and fruit are grown for local consumption. The prov. is rich in minerals, having mines of gold,

silver, copper, iron, lead, graphite, and manganese. Its area is 29,700 sq. m. Pop. 165,376.

San Luis, the capital, is 140 m. by rly. S.E. of Mendoza. It stands on a plateau, and is connected by rly. with the capital. The town is noted for its manufacture of ponchos. Horses, hides, wool, and other animal products are exported. Pop. est. 18,000.

San Luis Potosí. State of Mexico. Mainly situated on the central plateau, it is well wooded, and covers an area of 24,415 sq. m. Tropical fruits, cereals, and pepper are produced, and mining is carried on, the chief metals obtained being gold, silver, copper, and lead. Pop. 678,779.

San Luis Potosí. City of Mexico, capital of the state of the same name. Situated on the edge of a plateau 6,250 ft. alt., 327 m. N. of Mexico City by rly., it is regularly built, and has a cathedral and a handsome city hall. It has rly. workshops, smelters, and cotton, woollen, furniture, match, flour, and soap factories. In the neighbourhood are important silver mines. Pop. 77,161.

San Marco in Lamis. Town of Italy, in the prov. of Foggia. It stands on the slopes of Monte Gargano, 12 m. by road E. by N. of San Severo and 18 m. N.W. of Manfredonia on the gulf of that name. Fruit-growing is the chief pursuit. Pop. est. 17,000.

San Marino. European republic, entirely surrounded by Italian territory. Situated 12 m. S.W. of



San Marino arms

Rimini between the provinces of Forlì and Pesaro e Urbino, it claims to be the oldest state in Europe, and is one of the smallest states in the world. Authority rests in

the great council of 60 popularly elected members, a third of whom are renewable every three years, and from whom two selected councillors act as regents for a period of six months. Wine, cattle, and stone from quarries on Mt. Titano are exported. The frontier is 24 m. long, and encloses an area of 38 sq. m. The state is hilly, embracing spurs of the Apennines, on one of which, Mt. Titano, 2,650 ft., is the capital, San Marino, a walled city with a fine parliament house. In 1932 an electric rly. from Rimini to San Marino City was completed.

By repute a foundation of S. Marinus of Dalmatia, the city belonged to the exarchate of Ravenna

and, later, it came under the protection of the counts of Montefeltro. In 1631 the pope formally



San Marino. Citadel of the mountain republic situated in the heart of Italy

acknowledged its independence, which was recognized by Italy in 1862. Government is by two regents, elected every 6 months, and a council of 60 members. During the Second Great War, when fighting approached its frontiers, in Sept., 1944, San Marino mobilised its army of 300 and erected along its borders large signs with the words "Neutral—Keep Out" in four languages. The Germans, nevertheless, invaded San Marino and were followed by troops of the Allied 8th army. On Sept. 23, 1944, the republic declared war on Germany. Pop. 14,545. *Consult* in the Margin of History, H. Luke, 1933.

San Martín, José de (1778–1850). South American soldier. Born at Yapeyu, Argentina, Feb. 25, 1778, and brought up in Spain, he entered the Spanish army, and in the war with the French rose to the rank of lieutenant-colonel. In 1812 he went to Buenos Aires and joined the patriot party in the struggle to throw off the authority of Spain. After two years of preparation he led an army of Argentines and Chileans from Mendoza across the Andes and by his victories at Chacabuco, 1817, and the Maipo, 1818, ended the dominion of Spain in Chile. In 1820 he led an expedition against Peru, and in the following year entered Lima, the capital, and was chosen Protector. In 1822 he handed over the reins to Bolívar (q.v.), who had arrived with an army of liberation from the north, and after a brief stay in Chile and Argentina San Martín departed for Europe. He died at Boulogne, Aug. 17, 1850. A skilful soldier,



J. de San Martín, S. American soldier

and a man of fine personal character, San Martín's memory is revered by the people of Argentina, Chile, and Peru, the Peruvian dept. of San Martín being named after this national hero.

San Matías Bay. Wide and deep opening of the Atlantic Ocean in S. America. It penetrates inland between the territories of Rio Negro and Chubut, Argentina, for about 100 m. It is bounded S. by the Valdes Peninsula, from the N. point of which to Punta Vermejo is 77 m. To the S. lies the smaller enclosed bay of St. José.

San Miguel. Bay of E. Panama. It forms an E. extension of the Gulf of Panama, is 22 m. wide and 25 m. deep, extending farther in fjord-like branches running N.W. and S.E., forming San Miguel Harbour and Darien Harbour.

San Miguel. Dept. of S.E. Salvador, Central America. Bounded S. by the Pacific and W. by the river Lempa, its surface is mountainous with many fertile valleys, the land being drained by the San Miguel river. Thermal and medicinal springs abound. San Miguel, the capital, stands on the San Miguel river, 75 m. E.S.E. of San Salvador, and many of its houses are built of lava. It is situated in a rich agricultural region, trades in indigo, and holds a yearly fair. Nine miles to the S.W. is the active volcano of San Miguel. Pop., town, 53,817.

San Miguel de Allende. Town of Mexico. In the state of Guanajuato, it is 30 m. E. of Guanajuato city. It is named after Ignacio Allende (1779–1811), the Mexican patriot. It is a centre of trade in blankets, harness, etc. Population est. 12,000.

San Miniato. City of Italy, in the prov. of Pisa. It stands on a hill, overlooking the river Arno, 21 m. by rly. W.S.W. of Florence. It has a 10th century cathedral, partly rebuilt in 1488, the roof and frescoes of which were damaged during the Second Great War, and a medieval castle, the tower of which was blown up by the Germans in 1944. The original home of the Bonapartes, it trades in olive oil, glass, leather, and hats. The city was considerably damaged during the fighting for Florence, July–Aug., 1944.

Sann or Savinja. River of Yugoslavia in Slovenia. It rises S. of Guschowa peak in the Karawanken and flows S.E. to Cilli and then S.S.W. to join the Save.

Sannazaro, Jacopo (1458–1530). Italian writer. He was born at Naples, July 28, 1458, and is

believed to have been of Spanish descent. The most important of his works, *Arcadia*, 1504, is a pastoral romance of mingled prose and verse which had much influence on writers of other lands. Sir Philip Sidney (*q.v.*) borrowed its title and many of its episodes; the Portuguese pastoralists, Bernardim Ribeiro and G. de Montemayor, modelled their works on it; to it Shakespeare owed the name of Ophelia, and its influence is traceable in the work of Keats. Upwards of 60 editions of Sannazaro's *Arcadia* are known. It is regarded as the only Italian prose classic of the 16th century. Sannazaro died April 27, 1530. *Consult* Life, F. Colangelo, 1819.



Jacopo Sannazaro, Italian writer

San Nicolás. Town of Argentina, in the prov. of Buenos Aires. It stands on the river Paraná, 148 m. N.W. of the capital and 38 m. below Rosario, with both of which it is connected by rly. A thriving river port, it has a national college and normal school, flour mills, and a large beef-preserving industry. Frozen meat, soap, animal products, maize, and linseed are exported. Pop. est. 30,000.

San Pedro. Town and river port of Paraguay, and capital of the department of the same name. Situated on the river Paraguay a few miles above its junction with the Jejui, 95 m. N.N.E. of Asunción, it is a centre for exporting yerba maté (Paraguayan tea), and in the surrounding districts cattle are reared (canned meat being exported) and tobacco, rice, and sugar grown. Pop. 14,790.

Sanquhar. Royal burgh of Dumfriesshire, Scotland. It stands on the Nith, 26 m. N.W. of Dumfries, with a rly. station. The principal buildings are the town hall, erected by the duke of Queensberry, and the parish church. Textiles, mainly gloves, are manufactured, as are iron goods of various kinds. In the vicinity are coal mines, and the town is an agricultural centre with cattle and sheep fairs. There are

ruins of a castle which, evidently a building of great strength, belonged in turn to the families of Ross and Crichton. The Admirable Crichton (*see* Crichton, James) was born near Sanquhar, which was confirmed as a burgh in 1484. Pop. est. 2,000.

San Rafael. City of California, U.S.A., the co. seat of Marin co. It is 15 m. N. of San Francisco in a small valley not far from the N. end of the Bay of San Francisco, and is served by the North Shore and other rlys. It is a favourite pleasure resort, and has many beautiful villas and gardens. Here are the Hitchcock and Mt. Tamalpais military academies. Pop. 18,022.

San Remo. City of Italy, in the prov. of Imperia. It is 26 m. E.N.E. of Nice on the Riviera, has an exceptionally mild winter climate, and is a resort for sufferers from lung diseases. The old city, crowning a steep hill, with narrow crooked streets, provided a contrast with the new city along the coast, with its promenades, villas, and gardens. Perfumes and mosaics are manufactured, and Italy's only authorised casino is here. It was attacked by Horouk Barbarossa in 1544, by the French in 1625, and bombarded by the



San Remo arms



San Remo, Italy. Market place, showing the old cathedral

San Roque. Town of Spain, in the prov. of Cadiz. It stands near the head of the Bay of Gibraltar, 9 m. by rly. N.E. of Algeciras, and 7 m. N.W. of Gibraltar. A modern town, it was founded by Spaniards, who left Gibraltar after its capture by the British in 1704. It was for long a summer resort for British officers' families. Pop. 11,500.

San Salvador. The capital of Salvador (*q.v.*) republic, Central America. It is near the base of the extinct volcano of San Salvador, 8,360 ft., 25 m. from the Pacific coast, and stands at an altitude of some 2,000 ft. The dist. is subject to serious and frequent earthquakes, and the buildings are low, most of them, including the new cathedral, being of wooden construction. Considerable damage by earthquake was done in 1917 and 1919. The university, president's palace, and observatory are the prominent edifices. Indigo and tobacco are grown in the dist. Rlys. run to the ports Acajutla and La Libertad. The city was founded in 1525 by Jorge de Alvarado. Pop. 123,143.

San Salvador OR **BANZA.** Town in the N. of Angola. Capital of the ancient kingdom of Congo, it is about 170 m. from the coast. In the 15th cent. it was an important Portuguese settlement, and there are remains of ancient ecclesiastical buildings.

San Salvador, OR **WATLING'S IS.** One of the Bahamas. It was the first land in the New World sighted by Columbus, who gave it its name. Pop. 693.

San Salvatore. Mountain of Switzerland, in the canton of Ticino. It is situated near Lugano,



San Salvador, Central America. Calle Comercial, a business street in the centre of the city

British fleet in 1745. During the Second Great War the old city was little damaged, but the modern city suffered severely. Pop. est. 21,000.

overlooking the lake, and is approached by mountain rly. from Lugano. On the summit, alt. 3,000 ft., is a pilgrimage chapel. *See* Lugano.

Sansanding OR **SANSANDIG**. Town on the left bank of the Niger. It is in the French Sudan, about 370 m. S.W. of Timbaktu. The Sansanding barrage is the centre of an important irrigation scheme, to assist in the cotton and maize production of the district. Pop. about 4,000.

San Saturnino de Noya. Town of Spain, in the prov. of Barcelona. It is 18 m. direct and 29 m. by rly. N.W. of the city of Barcelona, and was known to Pliny as Noela.

Sansculottes (Fr., without breeches). Term applied by the court to the common people in the French Revolution. According to Littré, the Sansculottes were so called because they gave up the knee-breeches in fashion previous to the Revolution, and wore trousers or pantaloons. The excesses of the Revolutionaries gave a sinister association to the word, which is occasionally used of persons advocating political revolution.

San Sebastián. Seaport and bathing resort of Spain, capital of the prov. of Guipúzcoa. It stands

worthy buildings. There are breweries, saw and flour mills, and manufactures of sail-cloth, paper, cotton, soap, and glass, while the exports include cork, wine, fruit, turpentine, and wool. Long a formidable fortress, San Sebastián has been often besieged, notably in 1719, 1794, and 1808, when it was taken by the French; in 1813, when the Allies, under Wellington, drove out the French and utterly destroyed the town; and in 1836, during the first Carlist War, when the Carlists had to raise the siege. Pop. 124,892.

Other but smaller San Sebastián is the chief town of the island of Gomera in the Canaries, and a town in Puerto Rico, 12 m. direct E.S.E. of Aguadillo.

San Sebastián, SIEGE OF. Operation in the Peninsular War, July-Aug., 1813. San Sebastián commanded the road by which Wellington intended to cross the Pyrenees from Spain to France, and come to grips with Soult in what proved to be the final campaign of the Peninsular War. The reduction of the town was therefore a necessary preliminary. The siege opened July 10, and a furious but ineffectual assault was made on July 25, but it was only after constant skirmishes and battles that the town, excluding the castle, was

frescoes; in the new cathedral in the lower town there is a beautiful altarpiece by Pinturicchio. It was anciently known as Septempeda. Overrun by the Allies at the end of June, 1944, it suffered no damage during the Second Great War. Pop. est. 4,000.

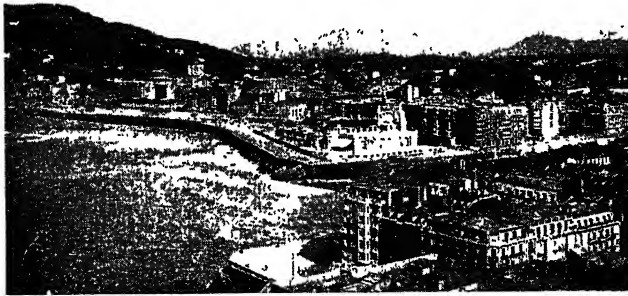
San Severo. City of Italy, in the prov. of Foggia. It stands at the base of Monte Gargano, 18 m. N.N.W. of Foggia. Some remains of its old fortifications are still extant, and it has a handsome cathedral. Fruit growing is the chief pursuit. The city was ruined by the army of Frederick II, and destroyed by the French in 1799; it has suffered from earthquake. San Severo was captured by the Allied 5th army advancing from Foggia on Oct. 1, 1943. Pop. est. 35,000.

Sanseveria. Genus of perennial herbs of the family Liliaceae, called the bowstring hems. Found in the tropical regions of the Old World, they have no stems but throw out runners. The lance-shaped root-leaves are thick and fibrous, and the flower clusters are pale yellow or green, or white. The E. Indian fibre plant or moorva belongs to the genus.

Sans-Gêne, MADAME (1774-1861). French adventuress. Thérèse Figueur, daughter of a grain merchant, was born at Talmay, Côte d'Or. Enrolled in a cavalry regiment at 19, she was vivandière at Hohenlinden, Toulon, Austerlitz, Jena, and Waterloo, had four horses shot under her, and was a prisoner at Lisbon and Southampton. She married in 1818 Clément Sutter, a dragoon, and, left a widow, died in poverty, Jan. 4, 1861. She is sometimes confused with La Maréchale Lefebvre, duchess of Danzig, to which mistake she possibly owes her fame, the duchess of Danzig being the subject of a play by Sardou and of two light operas.

Sanskrit. Old sacred language of the Hindus, in which the bulk of their literature is written. It is a member of the Indo-European family. The name means "carefully made," as opposed to Prakrit (*q.v.*) (common, natural). The relation of Sanskrit to Prakrit may be compared to that of Latin to the Romance languages of Europe.

Its most ancient form is to be found in the Vedas, certain parts of which may go back to about 1400 B.C. The Sanskrit of the Vedas may to some extent be considered a popular dialect, differing from classical Sanskrit as the Greek of Homer from classical Greek.



San Sebastián, Spain. General view of this port and holiday resort from Monte Urgull

on the Bay of Biscay, 11 m. by rly. W. of Irun, on the French frontier. Built on a peninsula ending in a steep, fort-crowned hull, enclosing a beautiful bay with a fine beach, it was chosen as a summer residence of the court in 1886, and speedily became the most fashionable seaside resort in Spain. It was defended by forts, but the old walls were razed in 1863, and the S. rampart was replaced by a boulevard.

The Palacio de la Diputación, the church of Santa Maria, and the royal palace of Miramar are note-

carried, Aug. 31. The castle fell Sept. 8. *See* Peninsular War; Wellington.

Sans-Serif. A printers' type without serifs. During the 20th century such types have been increasingly used in the U.K. and U.S.A., especially for display. This sentence is set in Gill Sans, a type designed by Eric Gill (*q.v.*).

San Severino. City of Italy, in the prov. of Catanzaro. It stands on the river Potenza, 18 m. by rly. W.S.W. of Macerata. The former cathedral in the upper town (alt. 1,130 ft.) contains some fine

About the 4th century B.C. the famous grammarian Pāṇini stereotyped the rules of grammar and syntax, and from that time Sanskrit became to all intents and purposes a dead language. Sanskrit is usually written and printed in the Devanagari character (*g.v.*), a development of the Semitic alphabet. In the matter of grammatical forms, it is richer than Greek and Latin: it has eight cases, including an instrumental and a locative; the verbal formations are extremely varied, and the power of making compound words is practically unlimited. A number of euphonic rules, called *sandhi* (putting together), are drawn up for the regulation of verbal combinations. The importance of Sanskrit consists not only in the fact that it is the language of an extensive and important literature, but it also forms the starting-point for the investigation of the Indo-European family. Modern comparative philology dates from the introduction of a knowledge of Sanskrit into Europe towards the end of the 18th century.

Like the language, Sanskrit literature may be divided into two main periods, the Vedic and the classical, beginning in the 5th or 6th century. Veda (knowledge) is the name given to four collections of hymns: Rig-Veda, Yajur-Veda, Sama-Veda, Atharva-Veda, the Veda of verses, of sacrificial formulae, of chants, of the priestly family of the Atharvas. The use of the hymns and the nature of the ritual are discussed in the Brahmanas, theosophical and metaphysical questions in the Upanishads; the Sūtras (rules) are concise manuals of ritual.

Sanskrit Epic and Drama

An especial characteristic of Sanskrit (not Vedic) literature is the general absence of prose, even scientific works being composed in metrical form. The commonest metre is the Sloka, used in epic poetry, of which there are four kinds, *itihāsa* (legend), *akhyāna* (narrative), *purāṇa* (ancient tales), and *kāvya* (artificial epic). The two great epics are the *Mahābhārata* and *Rāmāyana*, the Indian *Iliad* and *Odyssey*. These were followed by the *Purāṇas*, mythical

accounts of the creation, destruction, and renovation of the worlds.

The drama, as in other countries, appears to have originated in India in religious festivities and processions. To what extent it owed its origin and development to Greek influences, the result of Alexander's Indian expedition, is a disputed question. But, considering the time (some 400 years) that elapsed between the new Attic comedy of Greece and the earliest Sanskrit play, a Greek origin is doubtful, and its development in any case was national. The subjects are chiefly taken from mythology, history, and civil life. The dramatic masterpiece is the *Sakuntala* (name of the heroine) of Kalidasa, with which may be mentioned the *Mṛichchhakatika* (claycart) of Sudraka. Lyric poetry is almost entirely of an erotic char-

Vowels

अ, आ, इ, ई, उ, ऊ, ए, ऐ, ओ, औ
ए, ऐ, ओ, औ

Simple Consonants

Gutturals,	क	ख	ग	घ	ङ
Palatals,	च	छ	ज	झ	ञ
Cerebrals,	ट	ठ	ड	ढ	ण
Dentals,	त	थ	द	ध	न
Labials,	प	फ	ब	भ	म
Semi-vowels,	य	र	ल	व	
Sibilants,	श	ष	स		
Aspirate,	ह				

Numerals

१	२	३	४	५	६	७	८	९	१०	११	१२	३४५
1	2	3	4	5	6	7	8	9	10	11	12	345

Sanskrit. Characters from Monier Williams's Sanskrit Grammar

By courtesy of the Oxford University Press

acter. Kalidasa's *Meghaduta* (cloud messenger) and Jayadeva's *Gita-govinda* (cowherd in song) are most meritorious. Considerable importance attaches to the tales and beast fables, by reason of their close connexion with the West; it is a disputed question whether the Indian are derived from the Greek, or the Greek from the Indian. The most important fables are the *Panchatantra* (so called from being divided into five books), the source of much of the fable-literature of Europe, and the *Hitopadesa* (salutary advice). Real historical works can hardly be said to exist, all writings of the kind containing a large element of poetical fiction. The only one that has any claim to the name is the *Rajatarangini* (river of kings) by Kalhana, of value for the antiquities of Kashmir. (See Drama.)

In scientific literature the most important place is taken by grammar. Its chief representative is

Pāṇini (probably about 300 B.C.), whose 4,000 rules for all time settled the norm of correct language. Philosophy is represented by five great systems: Sāṅkhya, dualistic; Yoga (*g.v.*); Nyāya, specifically a detailed treatise on logic; Vaiśeṣika, in which great stress is laid on the atomistic theory; Vedānta (end of the Veda), the chief doctrine of which is the identity of the individual soul with God, the non-existence of phenomena. It is the system that has the greatest number of adherents at the present day.

Law, Medicine, and Astronomy

The law-books (*Dharma Sūtras*), representing the social Brahmanic ideal, are of considerable importance in the later literature; the laws of Manu and Yajñavalkya were the oldest and enjoyed the greatest reputation. Astronomy and the auxiliary sciences, although no doubt known to the Indians during the Vedic period, only assumed an important position under Greek influence. Through the Arabs, who became their pupils in the 8th and 9th centuries, the Indians exercised considerable influence over the West.

Astronomy, however, gradually degenerated into astrology, in spite of a temporary revival in the 18th century, and at the present time is in the hands of the astrologers and almanac-makers. The number of books on medicine, which was regarded as a supplementary branch of learning, is very large. Surgery, especially, reached a high standard of excellence; the making of artificial noses is an Indian invention introduced into Europe. With Buddhism medicine began to decline, but since the English occupation and the foundation of medical colleges, it has again revived.

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Sansovino, ANDREA, OR CONTUCCI (1460-1529). Italian sculptor and architect. Born at Monte



Andrea Sansovino, Italian sculptor

was employed in the decoration of

Born at Monte Sansovino, Tuscany, he studied under Antonio Pollaiuolo. After a visit to Portugal at the invitation of John II, he returned to Florence in 1490, when he

S. Spirito, and in 1500 executed the well-known statues of Christ and S. John Baptist over the E. door of the baptistery. His chief work, however, was the Storza monument in S. Maria del Popolo, Rome, 1506. He also carried out important architectural undertakings at San Sovino and Arezzo, and statuary at Genoa. Sansovino's sculpture was based on a study of nature, tempered by the classical tradition. A study by G. H. Huntley was pub. in 1935.

Sans Souci (Fr., without care). Palace near Potsdam, Germany, until 1918 the property of the German emperor and his predecessors, the kings of Prussia. With his love of French ideas, Frederick the Great gave this name to the residence he built at Potsdam in 1745-47, and also to the extensive park around it. It was a one-storey building, to be distinguished from the newer and larger palace built also by Frederick at the other end of the park in 1763-69.

San Stefano. Town of European Turkey. It is situated on the Sea of Marmara, 7 m. W.S.W. of Istanbul by rly. The Russian war monument above the Cape of San Stefano is a landmark.

San Stefano, TREATY OF. Signed between Russia and Turkey, March 3, 1878, on the conclusion of a war between them. By it the state of Bulgaria was created under Turkish suzerainty; Rumania, Serbia, and Montenegro were declared independent; and Russia secured various advantages. Reforms were promised to Armenia. The treaty, however, was greatly disliked, notably by British statesmen, and its terms were modified by the congress of Berlin. See Berlin, Congress of; Bulgaria; Eastern Question; Europe; Rumania; Russo-Turkish Wars; Turkey.

Sant, JAMES (1820-1916). British artist. Born at Croydon, April 23, 1820, he studied at the R.A. schools and showed subject pictures at R.A. exhibitions, also making a reputation as a portrait painter. Elected A.R.A. in 1861, he became R.A. in 1869, and his picture, *The Schoolmaster's Daughter*, is in the diploma gallery. In 1871 he became painter-in-ordinary to Victoria, and executed several royal portraits. Sant's most popular picture, widely circulated in reproduction, was *The Soul's Awakening*, 1888. He died July 12, 1916.

Santa Ana. Town of Salvador, Central America, capital of the

dept. of the same name. It is 48 m. by rly. N.W. of San Salvador, and the second most populous city in the republic, being the seat of a bishop. The centre of a coffee and sugar raising region, the neighbourhood also abounds in minerals, silver, copper, iron, and zinc being found. Pop. 98,942.

Santa Anna, ANTONIO LOPEZ DE (1795-1876). Mexican soldier and politician. Born at Jalapa, Vera Cruz, Feb. 21, 1795, he served in the Spanish army, but first came into prominence in Mexico's struggle for independence under Iturbide (*q.v.*). An astute but un-



A. L. de Santa Anna,
Mexican soldier

principled adventurer, he secured the presidency in 1833, but during his term of office completely alienated Texas, which secured its independence in 1836 after a war conducted with ferocity on the part of Santa Anna, who was finally captured and deposed.

In 1838 a memorable defence of Vera Cruz against the French, in which he lost a leg, brought Santa Anna a fresh accession of popularity, but he was again overthrown in an insurrection and banished in 1845. He returned in 1846, to become president again, and to take the field against the U.S.A. Defeated at Buena Vista and Cerro Gordo, he disappeared from Mexico in 1847, but came back to hold his last presidency from 1853 to 1855, when he was again compelled to leave the country. He made two further attempts to gain power, and died June 20, 1876.

Santa Barbara. City of California, U.S.A., the co. seat of Santa Barbara co. Situated on the Pacific coast, it is 105 m. by rly. W.N.W. of Los Angeles, and is served by the Southern Pacific rly. The Franciscan mission, the chief of the Californian missions, dates from 1786. Settled about 1782, Santa Barbara was long a centre of Spanish colonial life, and still shows Spanish architecture. It was incorporated in 1850 and is mainly a pleasure resort, devoid of industry. Pop. 34,958.

Santa Catharina. State in S. Brazil, bordering on the Atlantic. It is bounded N. by the state of Parana, S. by Rio Grande do Sul, and W. by the Misiones territory of Argentina. It has a much indented coastline and is

largely mountainous. Watered by the upper Uruguay (Pelotas), the Rio Negro, Iguassu, and other rivers, it is well adapted for agriculture, producing yerba maté, coffee, sugar, cotton, tobacco, etc. There are forests and good pastures, which maintain herds of cattle. Coal is known to exist. Many German settlements are scattered throughout the state. Education is compulsory. The capital is Florianopolis (*q.v.*). Area, 20,785 sq. m. Pop. est. 1,267,417.

Santa Clara. Fourth city of Cuba. Capital of Las Villas (formerly Santa Clara) prov., 180 m. E.S.E. of Havana by rly. and road. Its port is Cienfuegos, 40 m. S.W. Public buildings and parks have been recently designed, and industries are concerned with sugar and tobacco. Pop. 122,241.

Santa Claus. English variant of the Dutch popular corruption Sinter Klaas of the name Saint Nicholas (*q.v.*), bishop of Myra. In the Netherlands S. Nicholas's day, Dec. 6, is the children's festival. On the eve of his feast the saintly bishop comes riding from Spain, accompanied by his black servant and bringing with him presents which he places in the shoe each child has put on the hearth of the living room, taking in exchange the carrot left in the shoe for his horse. To good children he gives a present they want or will enjoy, to the bad (at least in theory) a bundle of rods. The morning of Dec. 6 is depicted in several of Jan Steen's paintings. The Calvinists fought in the 17th century against the perpetuation



Santa Claus. From a drawing by Sir John Tenniel, published in *Punch*, Dec. 28, 1895

By courtesy of the proprietors of *Punch*

of this "popish" festival, but in vain, and it is universally celebrated in the Netherlands. When the Dutch, first settlers in New Amsterdam (now New York), went to America in the early 17th century they took the festival with them. It was adopted by later English settlers, its observances, however, being transferred to Dec. 25 and added to the customary English celebrations of Christmas day. Santa Claus, in America and England, has become identified with Father Christmas, and is a figure greatly encouraged by retail shops in the interests of trade. The bundle of rods does not figure in the Anglicised legend; Santa Claus, from whom the saintliness has evaporated, comes from the North Pole in a sledge drawn by reindeer (a borrowing from Hans Andersen's fairy tales); and the English and American child hangs up a stocking, or even a pillow-case, for the receipt of presents.

Santa Cruz. Group of small islands in the Pacific, part of the British protectorate of the Solomon Islands. Ntendi, Tupua, and Vanikoro are the largest islands of the group, which lies S.E. of the Solomons and 100 m. N. of the New Hebrides. A dozen coral islets known as the Swallow Islands are included. The main islands are high, unhealthy, yet fertile. Ntendi, sometimes called Santa Cruz, has an area of 212 sq. m. Tinakula is an active volcano. The La Pérouse expedition was wrecked on Vanikoro in 1788. The group, known also as the La Pérouse or the Queen Charlotte Islands, was discovered by Mendana in 1595. The native pop. is declining and is less than 2,000.

Santa Cruz or **St. Croix.** Island of the Virgin group, belonging to the U.S.A. It is situated in the Caribbean Sea, 60 m. E.S.E. of Puerto Rico, is 21 m. in length, and has an area of 82 sq. m. The surface is largely level and well watered; the soil is fertile, and the main crop is sugar. The capital is Christiansted (*q.v.*) and the only other town is Fredericksted. English is the prevailing language.

Columbus landed on the island in one of his early voyages, and it was successively held by the Spaniards, English, and Dutch. In 1651 it was bought for the Knights of Malta, who sold it in 1664 to the French West India Co., by whom it was sold to the Danes in 1733. In 1801 it was taken by the British, who restored it after the battle of Copenhagen in the same year.

Re-taken by the British in 1807, it was again restored in 1814 to Denmark, who finally sold it to the U.S.A. in 1916. Pop. 16,200.

Santa Cruz. Southernmost territory of Argentina. It stretches S. from Chubut (*q.v.*), between the Andes and the Atlantic, to Tierra del Fuego, a portion of which is included. The coast-line is broken by several inlets, where the surface is low. Further inland are a series of desolate plateaux, and in the extreme W. there are outlying spurs of the Andean system. Several rivers traverse the territory from W. to E., and discharge into the Atlantic, *viz.* Desire, Bajos, Salado, Chico, Chalia or Sheuen, Santa Cruz, Coile or Cuheyh, and the Gallegos. There are many large lakes in the W., several of which it shares with Chile.

The territory is named after the river, which rises in Lago Argentino, an extensive expanse of water amid the outliers of the Andes, and empties into the Atlantic on the W. side of a deep gulf, forming the only good harbour in E. Patagonia; it is navigable for 160 m. The climate is dry and cool; agriculture is backward, sheep-rearing being the main industry. Great numbers of wild horses roam the plateaux. The capital is Gallegos, which stands on the estuary of the river Gallegos in the extreme S. Area, 93,952 sq. m. Pop. 24,491.

Santa Cruz. Easternmost dept. of Bolivia. It is situated W. of Brazil and N. of Chuquisaca. The surface is largely a level plain, with isolated mountain ranges, and there are large tracts under forest and swamp. It is well watered by the Mamore, Guapai, and Rio Grande, and is very fertile, but the climate is hot and unhealthy. The chief products are maize, rice, cotton, indigo, sugar, coffee, cocoa, and fruits. The forests yield rubber, dye-woods, and medicinal plants. Petroleum, iron, quicksilver, gold, and silver are found. Its area is 144,941 sq. m. Pop. 393,000.



Santa Cruz, Tenerife. The harbour from the Plaza de la Constitución. Top, Calle Castillo, the main business centre

Santa Cruz de la Sierra is the capital. It stands, at an altitude of 1,500 ft., near the river Piray, 185 m. N.E. of Sucre, and has a cathedral and a national college. The chief industries include flour milling, distilling, tanning, sugar refining, and the manufacture of boots, saddles, and blankets. Pop. 33,000.

Santa Cruz. City of California, U.S.A., the co. seat of Santa Cruz co. It stands on Monterey Bay, at the mouth of San Lorenzo river, 75 m. S. of San Francisco, and is served by the Southern Pacific Rly. It is a favourite seaside resort. The locality is noted for its superb sea-cliff scenery and its groves of giant redwood trees (*Sequoia sempervirens*). Leather, cement, asphalt, and lumber products are manufactured. Here Spanish friars built Santa Cruz mission in 1794; it was destroyed by an earthquake in 1864, and a replica erected in 1931. The Spanish regime having ended in 1846, Santa Cruz became a city in 1876. Pop. 16,896.

Santa Cruz. Capital of Palma, one of the Canary Isles, belonging to Spain. It stands on the E. coast in an open bay, having a depth of from 7 to 10 fathoms. Shipbuilding is extensively engaged in and exports include wine, fruit, and



cochineal. Pop. est. 7,000.

Santa Cruz. Seaport and coaling-station on the island of Tenerife, belonging to Spain. The capital of the island and also of the Canary Isles, it stands on the N.E. coast, and its good harbour, guarded by

the forts of the port, is well protected from the sea by a modern mole, and has good coaling facilities. The houses, built in the Spanish style, have flat roofs and central patios or courtyards. Situated on a small plain, amid volcanic rocks, it has little vegetation; water is supplied by a long aqueduct. The exports include silk, sugar, cochineal, tomatoes, bananas, potatoes, wine, and brandy. The place was twice bombarded by British fleets: under Blake, April 20, 1657, and Nelson, July 24, 1797. Nelson lost his arm in this action. Pop. 79,928. Santa Cruz gives its name to a prov. with area 1,329 sq. m. and est. pop. 401,283.

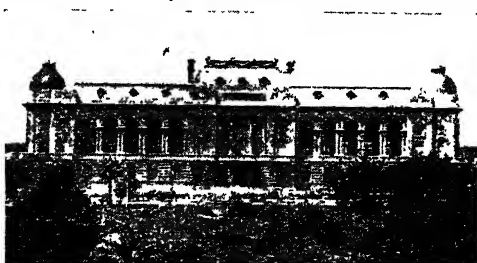
Santa Cruz, ALVARO DE BAZAN, MARQUESS OF (1526-88). Spanish admiral who conceived the design of the Armada. He was born at Granada, Dec. 12, 1526. He commanded the Neapolitan galleys against the Turks at Lepanto, 1571, and by his victory against the Portuguese at Tercera, 1583, secured for Spain the Atlantic islands of her rival. Designer of the huge Atlantic galleons for carrying troops as well as commerce, Santa Cruz proposed here 1583 to invade England, but there were continued delays, and he died Feb. 9, 1588.

Santa Elena. Town of Argentina, in the prov. of Entre Rios. It stands on the Paraná river, S. of La Paz, and manufactures meat extract, and trades in jerked beef, hides, horns, and other animal products.

Santa Fé (Span. Holy Faith). Prov. of central Argentina. It is bounded N. by the Chaco territory,

E. by Corrientes and Entre Rios, W. by Santiago del Estero and Córdoba, and S. by Buenos Aires. In the N. are vast forests (see Gran Chaco, El); in the S. are rich grazing lands. Stock-raising is the most important industry. Quebracho and other valuable woods are obtained from the forested areas. The chief crops are wheat, corn, flax, lucerne, alfalfa, and linseed. The land is drained by the Rio Salado and its tributaries. The climate is healthy, with ample rainfall, and the prov. is well served by rlys. Area, 52,056 sq. m. Pop. 1,700,026.

Santa Fé, the capital, stands on the Rio Salado, 95 m. N. of Rosario (*q.v.*), and its port is Colastiné on the Paraná, 7 m.



Santa Fé, Argentina. The palace of the provincial government

away. It has a cathedral, university, and schools. The most important industry is shipbuilding—there are two large docks for ocean-going vessels—and the principal exports are timber, cattle, and wool. The city was founded in 1573. Pop. 154,173.

Santa Fé. City of New Mexico, U.S.A., second oldest city in the Union. The state capital and the co. seat of Santa Fé co., it stands on the Sante Fé river, 50 m. W. of Las Vegas. It is still 16 m. from the nearest rly., although it has been a capital under the flags of four nations—Spain, Mexico, the Confederacy, and the U.S.A. Here three cultures meet, Indian, Spanish, and American. The ancient palace, built 1609-10, was the centre from which for 212 years the Spanish ruled a vast territory. Under Mexican rule for 75 years, Santa Fé passed to the U.S.A. in 1846 with the territory of New Mexico, receiving a city charter in 1851. The cathedral is the oldest Christian church in the U.S.A. Some traffic in cattle is carried on, but the main activity of the city is the tourist trade and the sale of brightly coloured Indian blankets and hand-worked silver jewelry. About 60 p.c. of the pop. is Spanish-speaking. Santa Fé has attracted artists and writers, including D. H. Lawrence. Pop. 20,325.

Santal or **SONTHAL**. Primitive tribe, occupying mainly the Santal Parganas, and the Chota-Nagpur plateau in W. Bengal, Bihar, and Orissa states, India. Numbering some 2,700,000, they are a partly Hinduised branch of the Munda-speaking people, whose customs, although still mostly primitive, have been affected by the Aryan subjugation. Thus, although primarily jungle dwellers and hunters, using the bow, many thousands have become skilful ploughmen and coal-miners.

Santalaceae or **SANDALWOOD FAMILY**. Family of trees, shrubs, and herbs. They are usually root-

parasites, natives of tropical and temperate regions. They have mostly alternate leaves and small greenish flowers. The fruit is nut-like or plum-like. The only important members of the family are the sandalwood (*q.v.*) trees.

Santa Maria.

Ship in which Columbus (*q.v.*) made his first voyage across the Atlantic in 1492. A decked vessel of 130 tons burden, she was 90 ft. in length, and carried a crew numbering 52.

Santa Maria. Town of Brazil, in the state of Rio Grande do Sul. It is an important rly. junction, about 170 m. by rly. W. by N. of Porto Alegre. Here are tanneries, breweries, and hat factories, while the surrounding district supports cattle and horses.

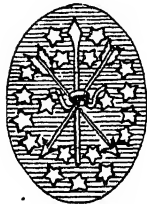
Santa Marta. Seaport of Colombia, S. America, the capital of the dept. of Magdalena. Situated at the head of Ciénaga Bay on the Caribbean Sea, and connected by rly. with Heredia on the Magdalena, it has a good harbour. Founded in 1525 by the Spaniards, Santa Marta was the second city to be established on the mainland, and was long a centre of exploration and conquests. A disastrous earthquake in 1834 laid the city in ruins. The surrounding dist. yields bananas. Pop. 43,950.

Santa Marta, SIERRA NEVADA DE. Range of snow-capped mountains in Colombia. The range is situated in the N. part of the dept. of Magdalena, and trends from W. to E. from near the coast to the borders of Venezuela, whence the mts. run N.E. The loftiest attain an alt. of over 17,000 ft. The N. face descends abruptly to the Caribbean Sea.

Santa Maura. One of the Ionian Islands. The ancient Leucadia, it is also known as Leukas (*q.v.*).

Santa Monica. City of California, U.S.A., in Los Angeles co. It stands on the Pacific Ocean, 15 m. by rly. W. of Los Angeles, and is served by the Pacific Electric rly. There is a military academy here. It is a favourite seaside resort, and above the sea front is Palisades Park. Pop. 53,500.

Santander. Maritime prov. of N. Spain, on the Bay of Biscay. It is bounded W. by the prov. of Oviedo and E. by Vizcaya. Largely mountainous, it is traversed in the



Santa Fé province arms

S. by the Cantabrian Mts., and is watered mainly by small streams flowing N. to the sea. The highest point is Peñas de Europa, alt. 8,600 ft. Large tracts are covered with forests and pasture. It has considerable coal, copper, iron, lead and zinc mining and manufacturing industries. There are several rlys. and many good high roads. Area, 2,108 sq. m. Pop. 414,204.

Santander. Seaport and watering-place of Spain, capital of the prov. of Santander. It stands on a



Santander, Spain. The castle of Don Beltrán de la Cuevas

sheltered bay, 316 m. by rly. N. of Madrid. There is an old town and a new town, the latter being laid out with large open plazas and boulevards. Its 13th century cathedral has been spoilt by bad restoration. A summer palace for the Spanish royal family, built here by public subscription, was used to house refugees after a great fire in Santander in 1941. In 1947 the title deeds were made over by the state to the heirs of Alfonso XIII. A large export trade is carried on in iron ores, and there is commerce in fish and tobacco. Santander has a fine harbour, accessible to the largest vessels. Exports normally include flour, wine, metals, and foodstuffs. Ironfounding and shipbuilding are carried on, and there are manufactures of paper, flour, beer, cotton, and iron goods. Part of the town was destroyed by the explosion of a dynamite-laden vessel, Nov. 3, 1893, when hundreds of the inhabitants perished. It figured in the Peninsular War, and was sacked by Soult in 1808. During the Spanish Civil War it was captured by the Nationalist forces, Aug. 25, 1937, the climax of an offensive from the S. lasting only 11 days. Pop. 114,348.

Santander. Dept. of N.E. Colombia. It is bounded W. by the river Magdalena, and E. by Venezuela. The surface is mountainous and rich in minerals, yielding gold, silver, and emeralds. In the fertile districts, tobacco, coffee, cacao,

and wheat form the principal crops. The capital is Bucaramanga (*q.v.*). Area, 12,379 sq. m. Pop. 615,710.

Santander Norte. Dept. of N.E. Colombia. It is bounded N. and E. by Venezuela, and W. by Bolívar dept. Mountainous and well watered, it produces gold, silver, precious stones, coffee, cocoa, cereals, rice, and sugar. The capital is Cúcuta (*q.v.*). Area, 8,295 sq. m. Pop. 346,181.

Santarem. Dist. of central Portugal, in the prov. of Estremadura. It lies to the E. of the Lisbon dist., and is well watered by the Tagus and its tributaries. The chief towns are Santarem and Thomar (*q.v.*). Area, 2,555 sq. m. Pop. 421,996.

Santarem. City of Portugal, capital of the dist. of the same name. It stands on the right bank of the Tagus, 51 m. by rly. N.E. of Lisbon. The key of the Tagus, here spanned by a fine, modern bridge, Santarem has played an important part in Portuguese history. Placed on a hill, and partly surrounded by old walls, it has a ruined castle, once a royal residence. There are 13th and 14th century and other churches, a large seminary, a museum containing many Roman relics, and a saline spring in the vicinity. Here are the tombs of Diniz I, Ferdinand I, and the explorer Cabral. Santarem carries on a trade in wine and oil, and there is a small modern river-port on the Tagus. Twice taken from the Moors, it was finally captured in 1147. In the neighbourhood of the city, the army of Dom Miguel was defeated by the allied army of Dom Pedro, under Napier and Villaflores, May 16, 1834. Pop. 12,000.



Santarem, Portugal. Church of the Asilo de São Antonio

Santarem. Town of Brazil, in the state of Pará. It stands on the right bank of the river Tapajós, near its junction with the Amazon, 450 m. W. by S. of Pará, and 62 m. S.W. of Montalegre. The surrounding districts yield rubber, cocoa, tobacco, nuts, medicinal plants, sugar, and cattle, all of which are exported. Pop. 40,000.

Santa Rosa. Town of Honduras, capital of the dept. of Copán. It stands at the foot of a mt. 140 m. N.W. of Tegucigalpa. It trades in tobacco, coffee, sugar, and grain. In the vicinity are gold and silver mines. There is an air service to San Pedro Sula. Pop. 6,018.

Santa Rosa de los Osos. Town of Colombia, in the dept. of Antioquia. It stands at an alt. of 8,560 ft., near the river Cauca, 170 m. N.W. of Bogotá. The chief occupation of the neighbourhood is gold mining. Pop. 16,000.

Santa Scala (Ital., holy steps). Flight of 28 marble steps at the Lateran palace in Rome, brought



Santa Scala, Rome. The holy staircase brought by S. Helena from the house of Pilate in Jerusalem

by the empress Helena from the house of Pilate in Jerusalem. Said to have been ascended by Christ, they are protected with wood and are ascended only on the knees. An adjacent flight is provided for the descent. See Lateran; Rome.

Santayana, GEORGE (b. 1863). Spanish-born American philosopher. Born in Madrid, Dec. 16, 1863, he went young to the U.S.A. Educated at Harvard, he lectured there during 1889-1911 on the history of philosophy. Meanwhile

and later he visited and lectured at Paris and Oxford.

A philosopher and poet in whom devotion to beauty struggled with the love of wisdom, he revealed in *Sonnet's and Other Poems*, 1894, the conflict between his mysticism and his scepticism. The first of his philosophical works, *The Sense of Beauty*, 1896, established his reputation in aesthetics, which was confirmed by essays, *Interpretations of Poetry and Religion*, 1900. *The Life of Reason*, 1905-06, won Santayana a high place among contemporary philosophers. While accepting the idealism of Aristotle and Hegel, he insisted upon a materialistic interpretation of experience. The persuasive charm of his writings may have inspired a conviction which his logic failed to sustain, but his influence upon contemporary thought was considerable. Later works included *The Realm of Matter*, 1930; *The Realm of Truth*, 1937; *The Realm of Spirit*, 1940; *The Realm of Being*, for which Columbia university gave him the Butler gold medal in 1945.



G. Santayana,
American philosopher

He pub. memoirs: *Persons and Places*, 1945; *The Middle Span*, 1948. **Santerre**. Dist. of France lying around Péronne. It is watered by the Somme and the Avre, and is sometimes divided into upper and lower Santerre. The name, which probably means the *sana terra* or healthy land, appeared in the 9th century, but the district never became a province, remaining for purposes of government part of Picardy.

Santerre, ANTOINE JOSEPH (1752-1809). French revolutionary. Born in Paris, March 16, 1752, he was a prosperous brewer, popular for his liberal treatment of his workpeople. He took part in the capture of the Bastille, 1789, and protected the royal family during the summer of 1792, in which year he was put in command of the national guard. He had charge of the royal prisoners in the Temple. Santerre commanded an army in La Vendée, 1793, but was later arrested as a suspected Orleanist. On release, 1794, he returned to civil life; but his business was ruined, and he died in poverty in Paris, Feb. 6, 1809.

San Thomé. Alternative name for the island of St. Thomas (q.v.).

Santi, GIOVANNI (c. 1430-94). Italian painter. He was born at Castello di Colbordolo, and is chiefly famous as the father of Raphael (q.v.). There is a Madon-

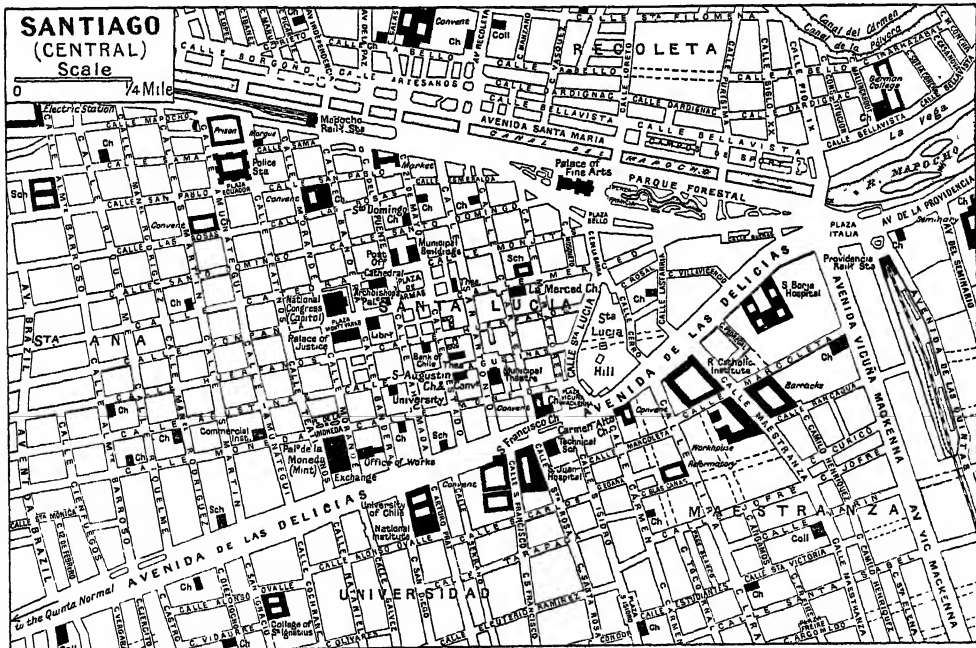
na and Saints by him in the church of S. Francesco, Urbino, and other works of no great distinction are preserved in that town's museum and in the neighbourhood. He died at Urbino.



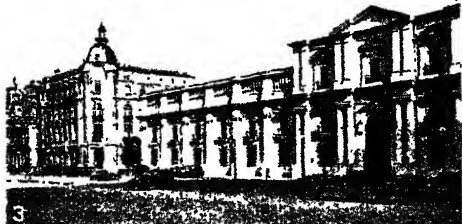
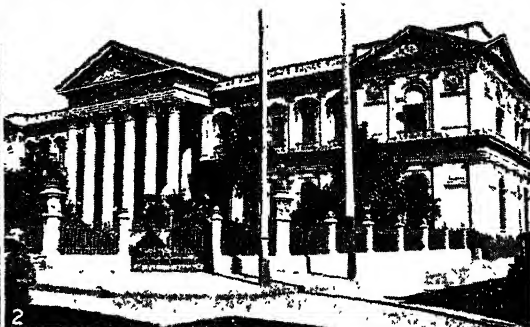
Giovanni Santi,
Italian painter

Santiago. Prov. of central Chile, lying S. of Aconcagua and Valparaíso. Traversed E. and W. by mountain ranges, enclosing a valley, the loftiest point is Tupungato, alt. 21,500 ft., an extinct and craterless volcano near the Argentine boundary. The principal river is the Maipo, but the prov. is poorly watered. Cattle-rearing is the chief occupation, and vegetables, cereals, and forage are grown. Its area is 5,557 sq. m. Pop. 1,261,717.

Santiago. Capital of Chile, S. America. The largest city in the continent W. of the Andes, covering about 8 sq. m. in area, it is situated, 1,706 ft. above sea level, in the great longitudinal valley of Chile, 68 m. E.S.E. of Valparaíso. One of the best built and most attractive cities of Latin America, Santiago is unrivalled for the picturesqueness of its immediate surroundings. The Plaza de Armas in the centre of the town is also the heart of its life, and here on



Santiago, Chile. Plan of the central districts of the city, showing the Avenida de las Delicias and the principal buildings



Santiago, Chile. 1. Avenida de las Delicias, also called the Alameda. 2. The Congress Building or Capitol, in the Calle Compañía. 3. Palacio de la Moneda, the president's residence. 4. The imposing Academy of Fine Arts. 5. The Cathedral, in the Plaza de Armas, the centre of the city

the W. stands its historic cathedral, on the N. the fine post office buildings, while there are arcaded commercial structures on the E. and S. It has become an essentially modern city, and "sky-scrapers" and smaller ten-storey buildings line the principal streets.

Congress building, farther W. in the Calle Compañía, is an imposing edifice occupying the site of the church of the Compañía, where in 1863 a large number of women and children of the most aristocratic families were burned to death. To the S. stands the Plaza de la Moneda, another fine public square, the whole of one side occupied by the immense Palacio de la Moneda, containing the residence of the president.

Grouped here are most of the other government buildings. The most notable feature of the city is the magnificent Avenida de las Delicias, better known as the Alameda, a spacious boulevard running E. and W., bordered with oak, elm, and acacia trees, and with little canals of running water, the avenue having been originally the bed of the river Mapocho. It is embellished with numerous statues and fountains, and to the N. rise the heights of Santa Lucía, a detached hill in the centre of the town,

while to the E. tower the snow-capped Andes, and W. the lower ranges of the Cordillera de la Costa encloses a view probably unsurpassed from any street in any city of the world, especially at sunset.

The hill (Cerro) of Santa Lucía, where the Spanish governor of Chile, Pedro de Valdivia, in February, 1541, made his camp and fortified himself against the Araucanian Indians at the founding of the city, has been turned into a public resort unique in interest and beauty. There are numerous other public parks, such as the Cousiño, beautifully kept, the Forest Park, and the Quinta Normal, where are horticultural and agricultural schools. Several of the buildings of the university, which dates from 1743, are noteworthy. There is a fine military school, a beautiful municipal theatre, and an art gallery in the style of the French Renaissance. Among the numerous churches the most notable, other than the cathedral, is that of La Merced, and in the general cemetery are monuments to many of the famous men of the nation, including Bernardo O'Higgins. Santiago is S. America's fourth largest city; more than half of Chile's industry is located there. Pop. 639,546.

Santiago. City of Cuba, capital of Oriente prov. Situated on the Bay of Santiago, 540 m. S.E. of Havana, with which it has road and rly. connexion, its chief buildings are the municipal offices and the cathedral. The bay forms a land-locked, deep, and commodious harbour, 5 m. long, with a mean breadth of 1½ m. Mining is an important industry, iron-manganese and copper being the principal minerals worked at Oriente. Ironfoundry and the manufacture of machine-shop products and tobacco are carried on, and the port has a large home and foreign trade. The city was the capital of Cuba 1515-56. During the Spanish-American War of 1898 the Spanish fleet was destroyed near the harbour on July 3, and the city surrendered on July 14. Pop. 120,827.

Santiago de Compostela. City of Spain, in the prov. of Corunna. It stands on the river Sar, 26 m. by rly. N.N.E. of its port, Carril, and 33 m. S.S.W. of Corunna. It has been the see of an archbishop since 1120. A pilgrim resort, its cathedral contains the shrine of the patron saint of Spain—Santiago el Mayor (James the elder). This striking edifice, the best example of early

Romanesque architecture in the peninsula, was founded in 1078, on the site of an earlier structure destroyed by the Moors in 997, and was consecrated in 1211. Alterations and additions in the 16th and 18th centuries have markedly altered its exterior. The superb cloisters are regarded as the finest in Spain. The doorway called the Portico de la Gloria was executed by Maestre Mateo during 1168-88.

Santiago possesses numerous churches, chapels, and religious fraternities, with hospitals, hospices, etc., for pilgrims. The university, founded in 1504, has a library containing over 70,000 vols. and many rare old MSS. The Hospital Real, another fine building, was founded by Ferdinand and Isabella for the benefit of pilgrims, while the convents of San Martin and San Francisco are worthy of note. The see of an archbishop, it is the headquarters of the Order of Knights of Santiago. The ancient Campus Stellae (field of a star), it was here, according to tradition, that the bishop of Iria found the bones of the saint. In the Middle Ages it was a centre of Christian art and chivalry, but it now presents a decayed and gloomy aspect, with its numerous ruined buildings. It carries on manufactures of linen, soap, spirits, matches, chocolate, and paper. Pop. 28,000.

Santiago del Estero. Prov. of north-central Argentina. It is bounded N. by the provs. of Salta and Formosa, S. by Córdoba, W. by Tucuman and Catamarca, and S.E. by Santa Fé. It lies partly in the Gran Chaco region (see Gran Chaco, El), and is watered by the rivers Juramento, Salado, and Dulce. It is well forested, has pampas and salt marshes, and is fertile along the riverside tracts. The climate is hot and dry, but healthy. The chief products are cereals, cotton, which was grown here as early as the time of the Incas, alfalfa, tobacco, sugar, indigo, hides, and grapes. The grazing areas support large numbers of cattle and horses, and the forests yield valuable woods. Area, 53,451 sq. m. Pop. 574,383.

The capital, Santiago del Estero, stands on the Rio Dulce, about 100 m. by rly. S.E. of Tucuman. A well-built town, it has a considerable agricultural trade. Founded by the Spaniards in 1553, it is the oldest town in Argentina. Pop. 76,445.

Santiago de los Caballeros. Town of the Dominican Republic. The capital of the prov. of Santiago de los Caballeros, it stands on the Yaqui river, 25 m. S. of Puerto Plata, in the valley of Vega Real, the most healthy dist. in the republic. The chief inland city, it lies in a fertile region, and has a large trade in tobacco, coffee, and hides. Pop. 59,605.

Santiago Zamora. Province of Ecuador, part of the region of Oriente (*q.v.*).

Santipur. Town of W. Bengal, India, in Nadia dist. It is situated on the left bank of the Hooghli, 45 m. above Calcutta. Formerly it was noted for its muslins and weaving, and was a centre of Sanskrit learning. Pop. 30,200.

Santley, Sir Charles (1834-1922). British singer. He was born at Liverpool, Feb. 28, 1834, and studied at Milan, and later in London under Garcia, and made a speedy success as a baritone

oratorio singer. He first appeared in grand opera at Covent Garden, 1859, and from 1875 toured extensively with the Carl Rosa Opera Company. He sang in the U.S.A. in 1871 and 1891, and in Australia, 1890. Knighted in 1907, he published *The Art of Singing*, 1908, and *Reminiscences*,



Sir Charles Santley, British singer

M. Levien, appeared in 1930.

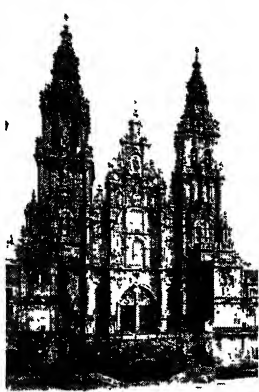
Santo Antão (Ilha de Santo Antão). Most northerly of the Cape Verde Islands. It was discovered by Diogo Afonso in 1462. It contains several extinct volcanoes; the highest, Pão de Assucar, 8,200 ft. Area, 265 sq. m.

Santo Domingo. Former name of the country described under its new name, Dominican Republic.

Santonin ($C_{15}H_{10}O_3$). Crystalline substance obtained from dried flower-heads of species of *Artemisia*. It is colourless, odourless, and insoluble in water. It is used in medicine to expel roundworm from the body.

Santorin or Thira. Island of the Greek archipelago, in the Cyclades group. Crescent-shaped, and mostly of volcanic origin, its steep W. shore, with the adjacent islands of Therasia and Aspronisi, represent the edges of a submerged caldera (*q.v.*); other volcanic islets in the vicinity have been uplifted within historic times. The last truly volcanic activity occurred in 1925. The culminating point on the island is Hagios Elias, or Mount St. Elias, alt. 1,900 ft. From the numerous vineyards a choice wine is produced and exported, and there is also trade in pozzolana earth. The chief town is Thira, on the W. coast, at an alt. of 900 ft. The site of ancient Thira, it is rich in prehistoric and Mycenaean dwellings and pottery. Thira was first settled about 2000 B.C. The modern name is a corruption of St. Irene. Area, 30 sq. m. Pop. 20,000.

Santos. Seaport of Brazil and leading coffee port of the world. It is situated on the Atlantic seaboard, in the state of São Paulo. Only a few feet above sea level, it is drained by deep channels. It ranks as a Brazilian port next to Rio de Janeiro, from which it lies



Santiago, Spain. Romanesque cathedral of St. James



Santos, Brazil. A general view from the heights overlooking the town

200 m. S.W. Hides, cacao, tobacco, frozen meat, bananas, and oil are exported, in addition to large quantities of coffee. The town is built on an island protected on the sea side by a larger island, and in the 20th century it was rapidly modernised, modern roads connecting it with São Paulo and other cities, and its streets being widened and rebuilt. Pop. est. 190,000.

Santos-Dumont, ALBERTO (1873-1932). Brazilian aeronaut. Born at São Paulo, Brazil, son of



A. Santos-Dumont, Brazilian aeronaut

a prominent coffee planter, July 20, 1873, he went to Europe and took up the study of aeronautics. He made his first balloon voyage at the age of 24, and thereafter devoted his attention to the problem of the navigable balloon. Between 1898 and 1906 he constructed numerous small airships, from which the non-rigid airship developed. He won the Deutsch prize of £10,000 at Paris in 1901. During the next few years he turned his energies to inventing heavier-than-air machines, and created world-wide interest when, on Aug. 22, 1906, he made the first hops from the ground with a power-driven machine, and on Oct. 23 achieved a flight of 200 ft. He published *My Airships: a Story of My Life*, 1904. He died July 25, 1932. Santos-Dumont airport at Rio de Janeiro was named after him.

San Toy. Musical comedy by Edward Morton and Sidney Jones. Produced at Daly's Theatre, London, Oct. 21, 1899, it had a run of 778 performances. Marie Tempest appeared in the title-rôle, and Hayden Coffin and Huntley Wright played leading parts. The setting is pseudo-Chinese, and famous songs include *Chinese Soldier Man*, *Rhoda and her Pagoda*, and *When Chinaman Him Go Flirtie*.

Santuao. Former treaty port in Fukien province, China. It was opened to foreign trade in 1899. There is a fine harbour. Pop. 11,561.

San Vicente. Dept. of Salvador, Central America. It is bounded E. by the river Lempa and S. by the Pacific. Low-lying in the coastal region, it is mountainous elsewhere. There are several extinct volcanoes, active geysers, and thermal springs. Pop. est. 100,000. The capital is San Vicente, standing amid indigo and tobacco plan-

tations, 24 m. E. of the city of San Salvador. Pop. 34,361.

São Francisco. River and town of Brazil. Rising in the Serra da Canastra, in the state of Minas Geraes, it flows N.E. through Bahia, and, curving S.E., discharges its waters by two arms into the Atlantic between Sergipe and Alagoas, after a course of about 1,800 m. Its course is impeded by the falls of Paulo Afonso, which descend 265 ft. in a series of leaps. The falls are circumvented by a rly., 68 m. in length. Ocean-going steamers of moderate draught can ascend the main stream for a distance of 135 m. The town of São Francisco is on the river, some 500 m. N. of Rio de Janeiro.

São Luiz de Maranhão. Seaport city of Brazil, capital of the state of Maranhão. It stands on the W. coast of the island, also called Maranhão, between the bays of San José and San Marcos, facing the entrance of the river Itapicourú. The harbour is accessible to ocean-going steamers. There are sugar, spinning, and weaving factories, and manufactures and exports of cotton, linen, skins, drugs, rubber, etc. Pop. 70,272.

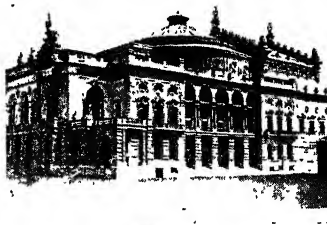
Saône. River of France. It rises in the Faucilles Mts. of the Vosges, and flows S. into the Rhône at Lyons. It flows across the plains of Burgundy, and is connected with the Rhine by the Rhine and Rhône canal, and with the Loire by the Canal du Centre. Its wide valley, the N. continuation of that of the Rhône, formed the connecting link via the Gate of Burgundy for medieval traffic between Marseilles, the Mediterranean, and the Rhine. See Fribourg; Lyons; Rhône.

Saône et Loire. Dept. of France. In the E. of the country, its area is 3,330 sq. m. It is crossed by the Saône and watered by that river and its tributaries. The Loire is a boundary river, and others are the Grosne, Arroux, and Arconce. Mainly hilly, the dept. contains the mountains of Morvan, Maconnais, and Charollais, the two latter being spurs of the Cévennes. Cereal crops are largely grown. Cattle, horses, sheep, and pigs are reared. Coal and iron are mined. Mâcon is the chief town and others are Châlon-sur-Saône, Autun, and Louhans. In the Middle Ages this dept. was included in Burgundy. Pop. 506,749.

São Paulo. Maritime state of S.E. Brazil. A narrow, low coastal plain is backed by a mountainous ridge parallel to the coast, the Serra do Mar; farther inland is a

plateau sloping gently to the Paraná, of which the tributaries Pardo, Tiete, and Aguapehy drain the sparsely populated W. portion of the state. São Paulo grows more coffee than any other state in Brazil; nearly half Brazil's cotton factories are here; and coal deposits occur. In the E. rlys. are well developed, the capital, São Paulo city, being connected with its port, Santos, and Rio de Janeiro. Education is compulsory. A separatist revolution against the federal authority in this state took place in 1924. Area, 91,310 sq. m. Pop. 7,230,168.

São Paulo. Second city of Brazil, capital of the state of the same name. It is situated, at an alt. of 3,000 ft., 45 m. inland from its port, Santos, with the Serra do Mar in between. The municipal theatre is one of the finest buildings of its type in the world. The magnificent Ypiranga palace was built as a memorial of the declaration of independence of 1822. The government building was formerly a Jesuit college, one of the oldest buildings in the city. The cathedral, bishop's palace, and the treasury are other prominent edifices. In the 20th century fine



São Paulo, Brazil. Office buildings in the commercial centre of the town, second largest city in Brazil. Top, the municipal theatre

new streets have been built, wide avenues being driven through former slums. This industrial and commercial capital of S. Brazil is one of the most prominent coffee centres of the world; it also supplies cotton, and is a great meat-packing centre. It is the most rapidly growing city in Latin America. Pop. 1,120,405. The origin of the city was a Jesuit mission station founded 1554.

São Salvador (Port., Holy Saviour). First name of the city in Brazil later called Bahia (q.v.).

São Thiago (*Ilha de São Tiago*). Most southerly of the Cape Verde Islands, its name being anglicised as Santiago. It was discovered by Antonio de Noli in 1460. It rises in the Sugar Loaf to about 7,500 ft., and has an area of 450 sq. m. Pop. (including that of the island of Maio), est. 110,000.

Sap. Juices of plants. The ascending sap consists of water in which mineral salts are dissolved, collected by the root-hairs from the soil, and conducted through the roots and the wood cells and vessels of the stem and leaf stalks to the leaves. Here it is vaporised by contact with the air circulating around the cells of the leaf, and passes out through the stomata. The mineral matter is retained and combined with carbon dioxide from the air, and from the mixture sugar, amides, etc., are formed, which are carried away in the descending sap through the phloem (q.v.) to those parts of the plant where they are required as cell-forming materials for present use or stored for future purposes. See Photosynthesis; Plant.

Sap. In military engineering, a ditch or road sunk below the surface of the ground, by which the ramparts of a fortress can be safely approached. In order to protect the traffic along this road from an enfilade fire the road, or sap, is not made straight, but zigzag from one parallel to another. The "parallels" are trenches, running at right angles to the sap, from which fire is opened on the fortress. Thus, the parallel corresponds to a fire trench and the sap to a communication trench. In trench warfare saps are frequently employed to provide exits from the fire trenches for raids, etc. The fact that all sapping was originally done by engineers accounts for the corps of Royal Engineers being popularly known as Sappers. See Fortification; Sapper; Trench.

Sapajou. Group of American monkeys of the genus *Cebus*, also known as Capuchin monkeys (q.v.).

Sapodilla Plum OR BULLY-TREE (*Achras sapota*). Evergreen tree of the family Sapotaceae. A native of Central America and W. Indies, it has wide-spreading branches, the bark is astringent,

and the juice milky. It has elliptic-oblong leaves, and large, whitish, urn-shaped flowers. The fruit is apple-shaped, luscious, and edible.

Saponification (Lat. *sapo*, soap). Term denoting the conversion of fats into soap by means of potash, soda, or ammonia. The method is practised on a large scale in the industrial manufacture of soap (q.v.). Different fats and oils require definite amounts of alkali for saponification, and this saponification value is employed as a test for the identity and purity of fats. The term in a more

general sense in organic chemistry denotes the resolution of esters into acids and alcohols.

Saponins. Glucosidal substances which occur in several plants, characterised by their property of giving a froth when shaken with water. The chief sources are soapwort (*Saponaria officinalis*), soap bark (*Quillaja saponaria*), and senega root (*Polygala senega*). Saponins usually have an acid taste, and cause sneezing when distributed in the air. They have been used for giving a froth to aerated and other beverages, and as cleansing agents. They are also the basis of certain "wetting agents" used in photographic processes for lowering the surface tension of solutions and permitting more even action on immersed objects.

Sapotaceae. Family of trees and shrubs. They are natives of tropical and sub-tropical regions, with milky juice and berry-like fruits. They have mostly leathery, alternate leaves, and bell-shaped or urn-shaped flowers. Several species yield gutta-percha. *Palaquium gutta*, formerly the chief source of this important material, has been killed out as a wild tree by the rapacity of the collectors, and the supply now comes from *Paysona Leeri* and others. *Lucuma*, *Achras*, *Chrysophyllum*, and *Bassia* have edible fruits; and *Sideroxylon* and *Argania* provide hard timber.

Sapper. Originally a soldier employed in cutting saps and also in building fortifications. It has come popularly to mean a member of the Royal Engineers (q.v.).

Sapper. Pseudonym of Cyril McNeile (1888-1937), British novelist. He was educated at Cheltenham and Woolwich, and in 1907 was commissioned in the Royal

Engineers; hence his pseudonym. After service in the First Great War, he retired as a Lt.-col. in 1919, and devoted himself to writing, having already published

novels about the war, notably Sergeant Michael Cassidy, 1915. Almost at once he sprang into popularity with Bulldog Drummond (q.v.), 1920, his particular type of swashbuckling good-humour, mingled with exciting action, striking what was then a new note in English light fiction. Drummond, his hero, appeared in several later novels, notably The Final Count, 1926, and Bulldog Drummond Hits Out, 1937. McNeile died Aug. 14, 1937.

Sapphic Metre. Form of metre attributed to Sappho. The Sapphic strophe as adapted by Horace and made familiar to us consists of four lines, the first three of which are identical, composed of a trochee, spondee, dactyl, trochee, and spondee or trochee, with the caesura usually at the end of the fifth syllable, while the fourth line is a dimeter containing a dactyl and a spondee or trochee. The formula thus is:

— u | — — | — u u | — u | — —
(three times)
— u u | — —

Sappho used this metre in her magnificent ode to Aphrodite. It is rarely encountered in English, though at least one familiar hymn, Lord of Our Light and God of Our Salvation, is written in it. It was also used by Cowper:—

Hard lot! encompassed with a thousand dangers
Weary, faint trembling with a thousand terrors,
I'm called, if vanquished, to receive a sentence
Worse than Abram's.

See Metre; Poetry; Sappho.

Sapphire. Blue variety of the mineral corundum. It has the same composition as the ruby, Al_2O_3 , and is found usually in the same localities. It is slightly harder than the ruby, and is dichroic, the most valuable varieties being pure cornflower blue. Sapphires are often spotted with yellow and white, and the blue colour disappears if the gem is heated. Asteria is the name given to a variety of transparent sapphire which shows six starlike rays



"Sapper,"
British author



Sapodilla Plum. Foliage and flower; inset, fruit

by reflected light. White topaz is sometimes called water sapphire, while yellow sapphire is a yellow variety of corundum. Colourless corundum is known as white sapphire or leucosapphire. The most valuable sapphires are found in Siam with the ruby, and Ceylon has long been known for the gem. Burma, Kashmir, Australia, the U.S.A., etc., are all sources of the stone, and poor qualities, valueless as gems, are found in many other localities. See Corundum; Precious Stones colour plate.

Sappho. In astronomy, one of the minor planets. It was discovered in 1864, and revolves round the sun at a mean distance of 275,000,000 m. Together with Iris and Victoria, it was used by Sir David Gill, 1888-89, to establish a measurement of the sun's distance.

Sappho (c. 580 B.C.). Greek poet. She lived at Mitylénē, and with her contemporary Alcaeus was one of the greatest of the Aeolic group of poets, and the leader of a literary society of women. Of noble birth, she is said to have been banished for political reasons, and to have gone to Sicily. The story that unrequited love for Phaon led her to leap from the Leucadian rock is fictitious. The social freedom of Aeolian women having been misunderstood in later ages, her moral character was traditionally blackened, but, whatever the inspiration of her verse, its quality is beyond all doubt. Only two complete poems are extant, including the fine ode to Aphrodite. These show that her genius was extraordinary, and she has been called the greatest woman poet. Her work, almost entirely erotic, is marked by depth of passion and exquisite grace. She used at least 50 different metres. Consult S. of Lesbos, A. Weigall, 1932.

Sapporo. City of Japan. The capital and chief garrison headquarters of the island of Hokkaido, it is about 100 m. N.N.E. of Hakodate, the chief seaport, and is connected by rly. with that port, with Otaru, its own seaport, and with the coal mines of Poronai. It contains a university, a museum, an agricultural school, and a botanical garden, and has manufactures of hemp, flax, beer, and flour. The city was laid out in 1869. Pop. 206,103.

Sapremia (Gr. *sapros*, rotten; *haima*, blood). Form of blood poisoning, in which toxins formed by bacterial activity are present in the blood stream, but the bacteria themselves are not present.

Saprophytes (Gr. *sapros*, rotten; *phyton*, plant). Plants which, lacking chlorophyll, are unable to manufacture carbohydrates in their leaves from the carbon-dioxide of the atmosphere. They were formerly classed with parasites, but the latter are known to live at the expense of other living things, whereas saprophytes live upon the decaying remains of animals or plants. Most of them get this from the humus of the soil, which is composed of the broken down remains of plants. Saprophytes are leafless, the leaves having disappeared altogether, or having been reduced to small scales. Flowering plants that are saprophytes obtain their food from the humus indirectly, by means of fungal hyphae (*mycorrhiza*, *q.v.*), investing the plants' roots. Most fungi that grow in the ground or on dead trees are saprophytes, as distinguished from those that attack living plants. See Botany; Plant.

Sapwood. Layers of wood near the periphery of a tree trunk, serving as channels for the flow of water, etc. It is also known as alburnum. As the tree grows, with the formation of newer rings at the outside, the former sapwood hardens into heartwood, and the later growths take on the function of sap transportation. In some trees, *e.g.* beech, more of the wood remains as sapwood than in other species. Sapwood layers are softer and have a more open grain than heartwood. Sapwood is lighter in colour, weak, and spongy; it is more prone to decay than wood nearer the centre of the trunk. For these reasons it is unsuitable for building work. See Timber.

Saraband (Span. *sarabanda*). Dance, probably of Hispano-Moorish origin, dating from the 16th century, and of a slow and stately character. The music, in triple time, was accented on the second beat of the bar. It was at first generally danced as a solo, as when Richelieu performed it before Anne of Austria, but when it reached England it became a kind of country dance. Later, as a purely instrumental form, it was incorporated in the suite (*q.v.*), of which it was the slow movement.

Sarabat. Small river of Asiatic Turkey, in Lydia. It is believed to be ancient Pactolus, rises in the Boz Dag, the ancient Mt. Tmolus, and joins the Gediz Chai or Hermus a few miles below Sardis. The gold washed from its sands was almost exhausted in Roman times.

Saraburi. This place, 108 m. N.E. of Bangkok (*q.v.*), was in

1945 selected as the future political capital of Siam, Bangkok remaining the commercial capital.

Saracens. Name formerly applied to Mahomedans. The name was given in classic times to the Arab tribes of Syria and the adjacent deserts, and thence came to include all Arabs. In the Middle Ages the term Saracen was applied to Mahomedans generally, but especially to those who fought the Crusaders in Palestine and Spain. See Arabia; Crusades; Louis IX: Mahomedanism; Saladin.

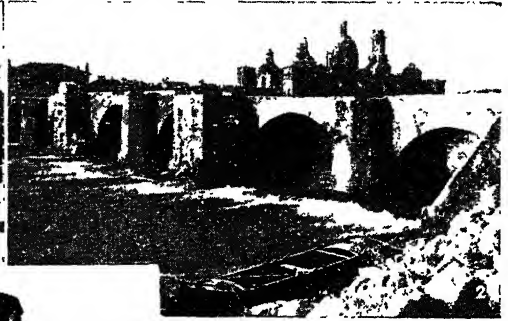
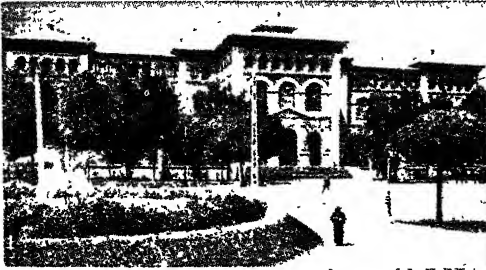
Saragossa (Sp. *Zaragoza*). Inland prov. of N.E. Spain. It stretches from near the Pyrenees on the N. to Teruel on the S., and is bounded N.W. by Navarre, W. by Logroño, Soria, and Guadalajara, and E. by Huesca. Mountainous in the N. and S.W., it is watered by the Ebro and its tributaries. The chief products are minerals, timber, sheep, cattle, wine, oil, flour, and fruit. Various industries are carried on in the towns, the most important of which are Saragossa, the capital, Calatayud, and Caspe. One of the largest provs. in Spain, it is one of the least densely populated, but is well served by rlys., most of which follow the river valleys. Area, 6,611 sq. m. Pop. 637,039.

Saragossa (Sp. *Zaragoza*). Fifth largest city of Spain, capital of the prov. of Saragossa. It stands on both banks of the river Ebro, here spanned by three bridges, 212 m. by rly. N.E. of Madrid. The former capital of Aragon, and the see of an archbishop, it has two cathedrals, a university, a Moorish citadel, and many fortress-like palaces. The old part of the city has tortuous and ill-paved streets.

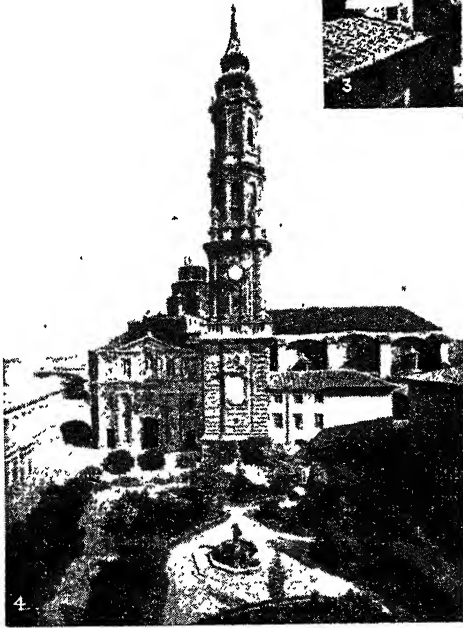
The old cathedral of La Seo dates from the 12th century; the façade and the octagonal tower were built at the end of the 17th century. The new cathedral of Nuestra Señora del Pilar contains a beautiful altar; it is much resorted to by pilgrims. Manufactures include cloth, silk, leather, spirits, machinery, glass, porcelain, soap, etc., other industries being iron-founding, tanning, and brewing. The Celtiberian Salduba, Saragossa derives its present name from Caesar Augusta of the Romans, after whom it was occupied successively by the Suebi, the Visigoths, and the Moors. It was conquered by Alfonso of Aragon,



Saragossa arms



in 1118, after a nine months' siege, and was the capital of the kingdom of Aragon until the end of the 15th century. In 1710 the British and Austrians here defeated Philip V. In the Peninsular War, Saragossa became famous by its heroic defence against the French, 1808-09. During the civil war of 1936-39 Saragossa was a bulwark of Gen. Franco's forces. Pop. 292,965.



Saragossa, Spain. 1. Main building of the university. 2. Stone bridge across the Ebro, showing the Cathedral del Pilar. 3. Torre Nueva, the 16th century clock tower, leaning 10 ft. from the perpendicular. 4. Façade and tower of La Seo, or church of the Saviour

Saragossa, MAID OF. Name given to Agustina (d. 1857), a Spanish national heroine, so called for her courage during the defence of Saragossa, 1808-09. Her deeds are described in Byron's *Child Harold*, canto 1, stanzas 54 ff.

Sarah OR **SARA**. Feminine Christian name. A Hebrew word, meaning princess, it was the name

of Abraham's wife, and was long very popular among both Jews and Christians. *See* Abraham.

Sarajevo. Variant spelling of the Yugoslav town *Serajevo* (*q.v.*).

Sarajoglu, SHUKRI (b. 1890). Turkish statesman. He was born at Odemis, and educated at Izmir and at Lausanne university. He joined Kemal Ataturk after the First Great War, and was minister of justice, 1932-38. After Ataturk's death in 1938, Sarajoglu was appointed foreign minister negotiating a treaty of

mutual assistance between Great Britain, France, and Turkey in 1930. He became prime minister in 1942. Sarajoglu favoured the Allied cause and soon severed diplomatic relations with Germany. His policy, while sometimes appearing ambiguous, was, in general, pro-Ally. In 1946 his cabinet resigned.

Saransk. Capital of the Mordovsk autonomous region, R.S.F.S.R. It is 75 m. N. of Penza, on the rivers Inzara and Saranka, and the Moscow-Penza rly. There are numerous tanneries, and considerable trade is carried on in grain, hemp, and furs. Pop. est. 15,000.

Sarapul. Town of R.S.F.S.R. It is on the Kama, 150 m. S.W. of Perm, in Sverdlovsk region. There are tanneries, boot and shoe factories, and considerable trade in grain. At Votkinsk, in the dist., are state ironworks for the manufacture of gun-carriages, railway engines, etc.

Sarasara. Volcano of Peru, in the dept. of Ayacucho. It is one of the peaks of a volcanic chain dominating the coastal region of Tarapacá. Its height is 20,000 ft.

Sarasate, PABLO MARTIN MELTÓN (1844-1908). Spanish violinist and composer. Born at Pampelona, March 10, 1844, he early showed signs of great technical ability and studied at the Paris Conservatoire 1856-59. He speedily made a European reputation as a violin virtuoso, and later acquired a new name as a composer of Spanish dances for the violin. He first played in London at the Crystal Palace, 1861, first visited the U.S.A. in 1870, and toured in all parts of the world except Australia. He died at Biarritz, Sept. 21, 1908.

Sarasvati. In Hindu mythology the wife of Brahma, goddess of eloquence, music, literature, and the arts. She is represented riding on a peacock, with a musical instrument in her hand. *See* Brahma; Hinduism.

Saratoga, BATTLES OF. Engagements in the American War of



P. M. M. Sarasate, Spanish violinist

Independence, 1777. Marching S. from Canada to join forces with Howe, who was near the Hudson, General John Burgoyne (*q.v.*) encountered the army of Horatio Gates near Saratoga. The first battle took place Sept. 19, and was a hotly contested fight between Burgoyne's forces, numbering some 4,000 men, and the American troops of Benedict Arnold (*q.v.*), 3,000 strong. Two hours of severe fighting ended inconclusively, though both sides lost heavily. On Oct. 7 Burgoyne launched another attack on the American position, but it was met by a counter-attack which, after a sharp battle, ended in the repulse of the British, who retreated 12 m. from Saratoga. There they entrenched themselves, but on Oct. 17 Burgoyne surrendered to Gates with the honours of war, his force at the time numbering some 5,000 men.

By the capitulation, sometimes known as the convention of Saratoga, the English were to embark as soon as they reached Boston, and were to pledge themselves not to serve in America again. The ratification of the convention was refused by Congress, however, and the British had to remain prisoners in America until peace was signed. See American Independence, War of.

Saratoga Springs. City of New York, U.S.A. It is 38 m. by rly. N. of Albany, and is served by the Delaware and Hudson and the Boston and Maine rlys. There are some thirty mineral springs here, all carbonated, the waters of which are efficacious in the treatment of rheumatism and dyspepsia. The resort which grew up around these springs became even more popular with the increasing following of the races. In 1933 a federal agency appropriated over \$3,000,000, to preserve the atmosphere of the spa and modernise it. Pop. 13,705.

Saratov. Town of R.S.F.S.R., capital of the region of the same name. It is on the right bank of the Volga, and on the Kozlov-Saratov rly. There are flour mills, leather, tobacco, and candle factories, and distilleries. There is also a big trade in grain, salt, and fish. The oil industry is important and prosperous, a pipe-line running 500 m. to Moscow and crossing rivers, swamps, lakes, and rlys. The university was founded in 1909; the Alexander Nevski cathedral was built in 1825. Other principal buildings include a Lutheran and a R.C. church and the Radishtchev museum. Pop. 376,000.

Sarawak. British crown colony in N.W. Borneo. It is bounded N.W. by Brunei, N.E. by British North Borneo, elsewhere by the Netherlands Borneo and the China Sea. The est. area is 50,000 sq. m. and pop. 500,000, most of whom are Dyaks, Malays, and Chinese. It is intersected by numerous rivers, many of which are navigable for considerable distances, and has a coast-line of about 450 m.

Kuching, the capital, situated on the Sarawak river, has a pop. of about 30,000. Sibü, on the Rejang river, has a large pop. of Chinese traders, who are the intermediaries between the tribes of the interior and the merchants of Singapore. Miri is the h.q. of the oil industry. Other places are Rintulu, Kapit, Sadong, Limbang, and Igan. The chief agricultural products are coffee, grown in Matang, pepper, sago, rubber, camphor, rattans, and tapioca. The principal mineral product is oil, from the neighbourhood of Miri. Gold is worked, and coal, of which there are considerable reserves, is mined at Sadong and elsewhere. Other products include antimony, diamonds, copper, and manganese. There are large exports of timber. Communication along the coast is by government steam launches, inland by road, around the capital, and waterway. There are no railways.

HISTORY. Sarawak was acquired Sept. 24, 1841, from the sultan of Brunei by Sir James Brooke (*q.v.* 1803-68), an officer of the East India Company, adding the Limbang river in 1890 and the Lawas river in 1904. Rajah Brooke, as he came to be called, secured British recognition of the independence of Sarawak in 1861. He was succeeded by his nephew, Sir Charles Brooke, who placed Sarawak under British protection in 1888. He was in turn succeeded by his son Sir Charles Vyner Brooke in 1917. In Nov., 1941, under a supplementary agreement, a British representative with certain limited powers was appointed.

On Dec. 16, 1941, the Japanese landed at Miri and Lubong Pt., British troops having been previously withdrawn after they had destroyed the oil refinery and installations at Miri. The Japanese occupied Kuching on Dec. 28, and by Jan. 1, 1942, British forces had retired W. from Sarawak to Netherlands Borneo. Units of the Australian 9th div. landed unopposed on June 20, 1945, at Lubong Pt. and on the 25th reoccupied Miri, where the Japanese had fired the

wells. Operations in Sarawak, linked with others in other parts of Borneo (*q.v.*) were continuing when Japan surrendered in Aug. The Japanese remaining in British Borneo surrendered at Labuan, Sept. 10, 1945, to Maj.-Gen. G. F. Wootten, commanding the Australian 9th div. Military administration of Sarawak ceased on April 15, 1946, when the rajah's rule was restored; but on May 21 Sir Charles Brooke signed an agreement ceding Sarawak to the crown, and on July 1 an order-in-council made Sarawak a crown colony with a constitution providing for a governor (Sir Charles Arden Clarke being the first to be appointed), a supreme council, and a legislative council. Divisional and district advisory councils representing the various peoples of Sarawak were also created. See Borneo; consult also History of Sarawak, S. Baring-Gould, and C. A. Bampfylde, 1909: *My Life in Sarawak*, Rance of Sarawak, 1913; *A Naturalist in Borneo*, R. W. C. Shelford, 1917.

Sarcey, FRANCISQUE (1827-99). French writer. Born at Dourdan, Oct. 8, 1827, he was educated at the Lycée Charlemagne and the École Normale. During 1851-58 he held teaching posts at Chaumont, Rodez, and then entered upon a literary career in Paris. Following on this he published critical articles in a variety of journals, and also several novels, which included *Le Nouveau Seigneur de Village*, 1862, and *Le Siège de Paris*, 1871, and acted as dramatic critic for *L'Opinion Nationale*, 1859-67. His fame is based chiefly, however, on his regular dramatic criticism for *Le Temps* from 1867 until his death on May 16, 1899. A selection of these articles appeared 1900-02. He was a sternly consistent critic, staunch to his clear if narrow standards, and showed hostility to the modern tendencies in drama.



F. Sarcey, French writer and critic

Sarcoma (Gr. *sarx*, flesh). Malignant tumour which differs from cancer in being formed from connective tissue, and in containing more fibrous tissue. Sarcomata may originate in the skin or subcutaneous tissues, the periosteum which invests bone, deeper parts of bone, the breast, testicle, or other organ of the body which con-

tains connective tissue. The tumour may occur at any age, but is more common below the age of 40, while cancer tends to occur after that age.

A sarcoma as it extends invades adjacent tissues, and the growing tumour may come to press upon a vital organ and so cause death. In its early stages a sarcoma is confined to the locality in which it originates, but in course of time small particles become detached and are carried away in the blood stream to other parts of the body, where they come to rest and give rise to secondary growths. No drug is of effective service in the treatment of sarcomata, and the only hope of saving life is in complete removal in the early stage before dissemination has occurred.

Sarcophagus (Gr. *sarx*, flesh; *phag-ein*, to eat). Coffin, usually of stone, especially one bearing sculptural enrichments or funerary inscriptions. The term denotes the supposed caustic action of certain stones. Originating in early Egypt for providing the dead with a house of eternity, the reproduction of contemporary dwellings passed into a mummiform type. The finest in England is the semi-translucent coffin of Seti I (Soane Museum). In Istanbul a splendid series from Sidon includes the so-called Alexander sarcophagus. Christian art adapted pagan sculpture to its ends; famous examples are the Julius Bassus, the Helena, and the

Constantia at Rome. A series at Ravenna of the 6th century includes that of S. Barbara. Etruscan terra-cotta coffins were surmounted by reclining effigies. See *Invalides*; *Phoenicia*.

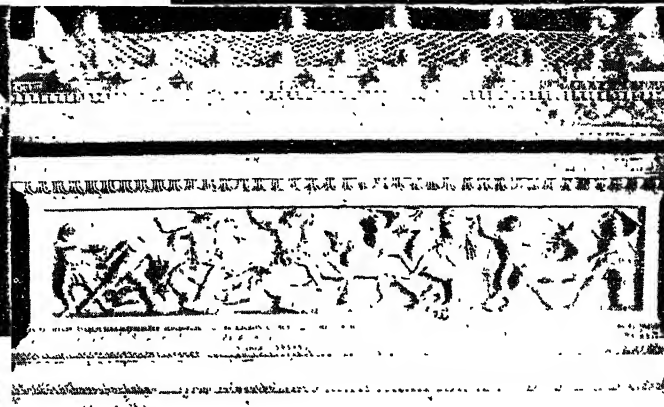
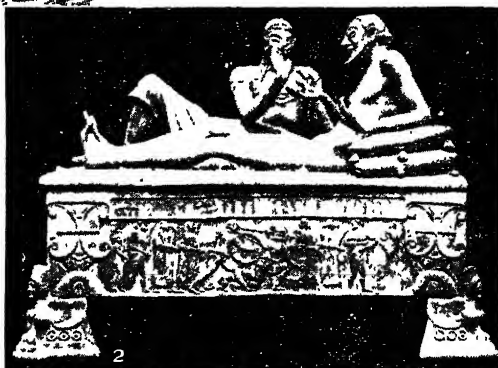
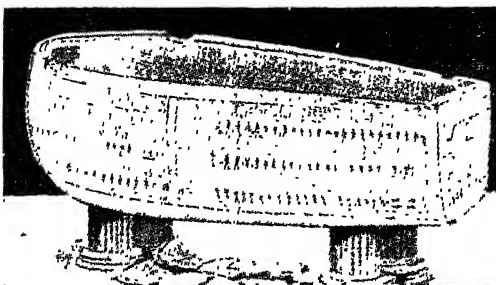
Sard. Variety of the cornelian. It ranges in colour from a light chestnut hue to an orange brown, and is much valued for signet-rings.

Sardanapālus. Legendary Assyrian king. According to Ctesias, Diodorus, and other Greek writers, he was an effeminate voluptuary who reigned in the 9th century B.C. Besieged in Nineveh for two

bodies also confused memories of authentic events two centuries later, especially under the peaceably disposed but not effeminate Ashurbanipal (q.v.), and under his brother Shamash-shum-ukin, who in 648 burned himself in his palace in Babylon. See *Nineveh*.

Sardica, COUNCIL OF. Assembly of the Church. It took place about A.D. 344, at Sardica, now called Sofia. It was convened by the emperors Constans and Constantius; but at the outset the bishops of the Eastern and Western Churches differed over the admission of Athanasius. The Eastern bishops withdrew, and held a rival council at Philippopolis. Hence neither of these councils can be regarded as oecumenical, and their decrees have never been formally recognized.

Sardine. Word originally used for a small fish of the herring family, when it is preserved in oil. The name is a corruption of Sardinia, as many fish for preserving were taken around that island. It has been held, however, that the word sardine is only applicable to the pilchard (q.v.).



Sarcophagus. 1. Aragonite or calcite sarcophagus of Seti I. 2. Etruscan terra-cotta sarcophagus, ornamented with hunting and battle scenes. On the lid are figures of the deceased and his wife. 3 and 4. End and side views of the so-called sarcophagus of Alexander, ornamented with coloured reliefs representing scenes of hunting and fighting

1. Soane Museum, from the Description of the House, by permission of the Trustees 2. British Museum 3 and 4. Istanbul

Sardinia. Italian island in the W. Mediterranean, forming a region of Italy. It is 89 m. wide and 168 m. long, with area 9,302 sq. m.; is separated from Corsica by the Strait of Bonifacio; and is 115 m. from Italy. The gulfs of Oristano and Cagliari are connected with the low plain of Campidano. S.W. of the plain the highlands are rich in minerals, especially copper and silver-lead ores; N.E. of the plain are other mts. which are well marked along the E. coast; the culminating peak in the Gennargentu mts. is 6,365 ft., near the centre of the island. Forests cover a fifth of the area, though the rainfall is slight, and summer is a season of drought. Wheat, wine, and olive oil are produced. Agriculture, despite the fertility of the soil, is backward, owing to the smallness of the holdings and the liability to floods and malaria on the low plains. Charcoal, fish, salt, wine, olives, and various minerals are the principal exports. There are universities at Cagliari, the capital, on the S. coast, and Sassari. Pop. 1,196,000.

Sardinia abounds in remains of the Bronze Age, including *nuraghi* or fortified dwellings, and so-

called giants' graves. Whether the Shardana, who served as mercenaries in Egypt under Ramesses II, were Sardinians is uncertain. Sardinia was partially conquered and settled by Carthage about 500 B.C., and there were a few Greek colonies. A mutiny of Carthaginian mercenaries in 238 B.C. gave the Romans a pretext for annexation, and the island, with Corsica, was made a province. The natives resisted stubbornly, and there were repeated revolts, and constant brigandage.

The Vandals held the island during 456-534, and after a brief Ostrogothic occupation, it was conquered by Narses for the E. Roman empire, to which it belonged for four centuries. The Saracens having long harassed Sardinia, Pope John XVIII offered the island to any power that would expel them. Pisa thus acquired the sovereignty early in the 11th century, though Genoa at times gained a footing in the island. From 1164 Sardinia was at least nominally a kingdom. Aragon expelled the Pisans, 1323-26, and Sardinia was under Spanish viceroys from 1478 to 1713, when it passed to Austria, and in 1720 to Savoy, whose duke became king of Sardinia.

Sardinia was used as an air and naval base by the Italians during the Second Great War, military targets being frequently bombed by the Allies. On Nov. 27, 1940, there was a running fight off the W. coast of the island between units of the R.N. and Italian warships, in which an Italian battleship and several cruisers were damaged. In Aug., 1941, British aircraft set fire to the cork forest on the outskirts of Tempio. After the surrender of Italy Sept. 3, 1943, the Italian garrison forced the German troops on the island to evacuate it.

Sardinia. Former Italian kingdom, whose ruler became king of Italy in 1861. By the treaty of London, Aug. 24, 1720, Victor Amadeus II, duke of Savoy, agreed with Austria to exchange Sicily for the island of Sardinia, of which he became king. The island which thus gave the family of Savoy its regal title was of subsidiary importance to their realms, which were otherwise on the mainland, with the capital at Turin.

Victor Amadeus abdicated in 1730 in favour of his son, Charles Emmanuel I, but the latter's son, Victor Amadeus, having sided with the French royalists, was driven from his throne by the Republican armies under Napoleon in 1796. Savoy and Nice were annexed to France. Charles Emmanuel II (1796-1802) vainly strove against Napoleon. In 1802 Piedmont became French, the new king, Victor Emmanuel I, brother of Charles, holding sovereignty only over the island of Sardinia. The congress of Vienna, 1814, reinstated the house of Savoy and added the territory of the former republic of Genoa to their realm.

The kingdom thus comprised Genoa, Savoy, Aosta, Piedmont, Nice, and Sardinia. An insurrection against the misgovernment of Victor Emmanuel I caused his abdication in 1821 in favour of his brother, Charles Felix, upon whose death ten years later the crown of Sardinia passed to the Carignano branch in the person of Charles Albert. This king's liberal tendencies and staunch devotion to the cause of Italian freedom saved his throne in the revolutionary whirlwind of 1848, though he himself, who had led his army against the forces of despotic Austria, was hopelessly defeated at Novara, March 23, 1849. He abdicated on the battlefield in favour of his son, Victor Emmanuel II, who made the name of Sardinia synonymous with liberty and the union of Italy.

By participation in the Crimean War of 1854-55 Victor Emmanuel raised Sardinia to the dignity of a seat in the council of nations at Paris. By the sacrifice of Nice and Savoy in 1860, his prime minister Cavour bought the assistance of Napoleon III to drive the Austrians from Italy; but the kingdom ceased to exist when Victor Emmanuel was crowned king of Italy in 1861. See Cavour; Italy; Savoy; Victor Emmanuel II.

Sardis OR SARDES. Ancient capital of the kingdom of Lydia.



Sardinia. Map of the Mediterranean island forming a region of the republic of Italy

Captured by the Persians in 546 B.C., it figured later in the Ionian revolt. After Alexander the Great took it in 334 B.C. it became a Greek city of importance, and was still a considerable place when it passed under Roman rule. It was the seat of one of the earliest Christian bishoprics, and was one of the seven churches of Asia addressed in the Apocalypse. The city was destroyed by Tamerlane in the 15th century, and is now represented by Sart, a village lying about 50 m. E. of Izmir.

Sardonyx. Variety of chalcedony. It displays alternate bands of white and brown. It is mounted in jewelry with a plain table surface, carved or engraved, and is used for other ornamental purposes. See Precious Stones.

Sardou, VICTORIEN (1831-1908). French dramatist. Born in Paris, Sept. 7, 1831, he suffered dis-



Victorien Sardou,
French dramatist

appointments with early plays and endured privation before achieving success in 1860 with *Monsieur Garat* and *Les Prés Saint-Gervais*, written for the actress Déjazet.

A writer of extraordinary fertility and cleverness, he succeeded in almost all forms of drama: the comedy of intrigue, e.g. *Les Pattes de Mouche*, 1860, familiar in English as *A Scrap of Paper*; the comedy of manners, e.g. *La Famille Benoiton*, and *Nos Intimes*; political comedy, e.g. *Rabagas*; historical drama, e.g. *Patrie*, *Thermidor*, and *Madame Sans-Gêne*. Many later melodramas, e.g. *La Tosca*, were written for Sarah Bernhardt, and Sardou also wrote *Robespierre*, 1902, and *Dante*, 1903, for Irving. Dora was popular in England under the title *Diplomacy*. Sardou's merits were essentially theatrical; his psychology was superficial, but he was a consummate master of technique and stage effect. He died in Paris, Nov. 8, 1908.

Sargasso Sea. Region of the Atlantic Ocean, lying off the American coast about the latitude of Florida and reaching about halfway towards Africa. It is composed of floating masses of brown seaweed characterised by numerous small berry-like bladders. This dense gulf weed (*Sargassum bacciferum*) is the home of many small marine animals, crabs, prawns, etc. It is supposed that the weed grows on the American

coasts and is torn away by the waves and washed by the currents round the North Atlantic into the comparatively still waters, where it floats in accumulated masses. The older masses of weed slowly lose their power to float and then sink and perish. Columbus discovered the Sargasso Sea, which for long had an unenviable reputation, as it was thought that any ship forced into it was doomed to destruction. Recent scientific expeditions have demonstrated that ships need have little fear of the masses of weed.

Sargent, SIR (HAROLD) MALCOLM (WATTS) (b. 1895). English conductor, born April 29, 1895.



Sir M. Sargent,
English conductor

From school at Stamford he went to study music at Peterborough cathedral, and was a church organist at Melton Mowbray until 1924. A professorship at the R.C.M. came in 1923. This inspiring conductor was associated with productions of *Hiawatha* at the Albert Hall from 1926; Royal Choral Society from 1928; Courtauld-Sargent concerts, 1929-40; Liverpool Philharmonic orchestra from 1942; promenade concerts from 1947; and countless provincial festivals. Sir Malcolm, who was knighted in 1947, became known as the British musical ambassador by his European tours for the British Council, and was often on the B.B.C. Brains Trust. In 1950 he succeeded Sir Adrian Boult as conductor of the B.B.C. symphony orchestra.

Sargent, JOHN SINGER (1856-1925). Anglo-American painter. Born in Florence, of American parents, he studied at Florence, and in Paris under Carolus-Duran. Settling in Chelsea, he soon attracted attention as a portrait painter. He became A.R.A. in 1894, and R.A. in 1897; and was a



John S. Sargent. *Carnation, Lily, Lily, Rose.* A masterly example of the artist's subject painting
Tate Gallery, London

conspicuous exhibitor at the Salon. Among his works are portraits of Ellen Terry as Lady Macbeth, the Misses Wertheimer, Mrs. Carl Meyer and Children, Joseph Chamberlain, and "*Carmenita*." Later the slashing bravura of his earlier style refined itself, and sunlit land-



John S. Sargent,
Anglo-American
painter

scapes occupied him, though his chief reputation remained that of a portraitist. His *Carnation, Lily, Lily, Rose* is in the Tate Gallery. He died April 14, 1925.

Sargon. King of Assyria, 722-705 B.C. The Biblical spelling represents the cuneiform Sharrukin, assumed by a military usurper who founded the Sargonid, the last Assyrian, dynasty. After the capture of Samaria he deported its inhabitants. He overthrew Hamath, 720; Carchemish, 717; Ashdod, 711 (Is. 20); and Mita of Mushku and Merodach-baladan of Babylon, 709. His son Sennacherib succeeded him. See Assyria; Karkar; Mushki; illus. p. 7322.

Sargon, or, more correctly, **SHARRUKIN.** King of Akkad, N. Babylonia. The Neo-Babylonian tradition which dates him about 3800 B.C. is regarded by many scholars as 1,000 years too early. Of humble origin, a gardener and temple-warder, from Kish in



Sargon, King of Assyria. From a relief copied by C. Chipiez. See p. 7321.

Sumeria, he captured Ur and Lagash and founded a powerful Semitic dynasty. See Naramsin.

Sarik. Turcoman tribe, living mostly in Turkmen S.S.R., E. of the Caspian. Numbering perhaps 60,000, they were ousted from the Merv oasis by the Tekke tribe in 1850, and now occupy the Murg-hab basin between the Yulatan oasis and Penjdeh, with an offshoot in Afghan Turkistan. Organized in five or six clans, they practise horse-breeding and agriculture.

Sar-i-Kul OR **GAZ KUL.** Lake of Central Asia, also known as Lake Victoria. Lying on the S. of the Pamir, the high plateau N.E. of Afghanistan, from which the chief mountain chains of Asia diverge, it is the source of the Pamir river, a parent stream of the Amu-Daria (Oxus). It is at about 14,000 ft. above sea level.

Sariputta. Name of a disciple of Buddha, who lived in the 6th century B.C. The son of a Brahman, he early devoted himself to an ascetic life, and was one of the first to join the Buddhist movement. His piety and learning placed him at the head of the disciples, and his discourses with the Buddha are collected in the Buddhist scriptures. He died shortly before his master, and an urn containing some of his ashes was discovered at Sanchi in 1851.

Sark OR **SERQ.** One of the Channel Islands. It is 3 m. long and about 1,270 acres in area. It lies 6 m. E. of Guernsey, and consists of two peninsulas, Great Sark and Little Sark, joined together by a narrow, elevated causeway called the Coupée. Almost surrounded by rocks, it has a tiny harbour on the E. coast known as Creux, and access to the interior is gained through tunnels cut in the rocks. Sea fowl and fish abound, and there is some agriculture. Sark is remarkable for the grandeur of its cliffs and caves, and its praises have been sung by Swinburne in *A Ballad of Sark*, and by John Oxenham. It has a seigneur (or a dame) and forms part of the bailiwick of Guernsey.

On June 28, 1940, the Home office announced that Sark had been demilitarised; and on July 1 a small German force occupied the island. Sibyl Mary Hathaway, dame of Sark, remained on the island, her husband being taken to Germany 1943-45. A British Commando raid made on Sark on the night of Oct. 3-4, 1942, to confirm suspicions of ill-treatment of the population, found evidence of deportations to Germany for forced labour. On May 9, 1945, the Channel Islands were liberated; British military government ceased on Aug. 25. Pop. 600.

Sark. Stream of Dumfriesshire, Scotland. It rises in the Collin Hags and flows mainly S. to the E. end of Solway Firth. For the lowest 7 of its 13 m. it forms the boundary between England and Scotland. Its chief affluent is the Black Sark.

Sarlat. Town of France. In the dept. of Dordogne, it is 44 m. E. of Bergerac. The chief building is the former cathedral, which has some interesting architectural features. There is a building of the 12th century. Sarlat trades in cattle, while coal, iron, and lithographic stone are mined in the vicinity. The town grew up round an abbey founded soon after 800, and was the seat of a bishop until 1790. Pop. 6,200.

Sarmatia. Name given in ancient times to the large tract of country bounded roughly by the Carpathians, the Vistula, the Volga, and the Black Sea, but stretching to the N. as far as the Baltic. Its chief inhabitants were the Sarmatae, probably a Slavonic people. These, after conquering the Scythians, were themselves in turn conquered by the Goths. The chief Sarmatian tribes were the Iazyges and the Roxolani.

Sarmiento. Isolated mountain of S. America. It is situated on the S. side of Gabriel Channel, in the Chilean portion of Tierra del Fuego, alt. 6,910 ft. It was named after Pedro Sarmiento, the Spanish navigator (c. 1530-87), who explored the Strait of Magellan.

Sarmiento, DOMINGO FAUSTINO (1811-88). Argentine statesman and author. Born Feb. 14, 1811, at San Juan, of a Spanish family, he joined in 1829 the army of Gen. Paz, after whose defeat in 1831 he fled to Chile, where he remained until 1836, and again, 1840-52, in consequence of his newspaper attacks on the Argentine government. He joined Urquiza in his revolt against the tyrant Rosas,



Sark, Channel Islands. The road along the Coupée, showing the wild scenery on the wonderful natural causeway which connects the two parts of the island.

fought at Monte Caseros, 1852, and on the fall of Rosas became inspector-general of schools. In 1864-65 he was ambassador to Chile and Peru, then minister at Washington. President of Argentina 1868-74, Sarmiento carried out educational reforms. His books include *L'Education Populaire*, 1847, and *A Life of Lincoln*. He died Sept. 11, 1888.

Sarnen. Town of Switzerland. The capital of Obwalden, the W. half of Unterwalden (*q.v.*), it stands on the river Aa, at the N. end of the small Lake of Sarnen, 13 m. S. of Lucerne on the rly. It is situated at an alt. of 1,556 ft. Pop. 5,282.

Sarnia. City and port of Ontario, Canada. Situated on the river St. Clair, near Lake Huron, opposite Michigan, 170 m. S.W. of Toronto, it is a station on the C.N.R. and the Pêre Marquette rly. Steamers go from Sarnia to ports on the Great Lakes and the St. Lawrence. It is connected with Port Huron on the American side of the St. Clair by a rly. tunnel and the International Bridge. The industries include lumber mills, and it is here the largest oil refinery in the British Empire is situated. Pop. 18,734.

Sarno. City of Italy, in the prov. of Salerno. The ancient Sarnus, it stands near the source of the river Sarno, 14 m. by rly. N.W. of Salerno. It has the ruins of an old castle and a 17th century cathedral. The chief manufactures are linen, cotton, silk, paper, leather, and wine. There are mineral springs in the vicinity. In 553 Sarno was the scene of an overwhelming defeat inflicted on the Ostrogoths under Teias by the troops of Justinian under Narses. Pop. approx. 15,000.

Sarolea, CHARLES (b. 1870). Belgian administrator and scholar. Born at Tongres, Oct. 25, 1870, he was educated at Liège university. In 1901 he became Belgian consul at Edinburgh, where during 1894-1931 he was lecturer first and head later of the French and Romance dept. at the university. He was founder editor of *Everyman*, 1912-17. During the First Great War he raised over £100,000 for Belgian relief in Great Britain and the U.S.A., and as political adviser accompanied Albert I to Brazil and W. Africa, 1920. The famous people of whom Sarolea wrote studies include Ibsen, 1891; Hugo, 1911; Tolstoy, 1912; Joan of Arc, 1918; Masaryk and Lincoln, 1920. *Daylight on Spain* was published in 1938.

Sarong (Malay, covering). Traditional dress of all Malayan women. A length of cotton material, patterned by the batik (*q.v.*) method, the sarong is wound closely about the body from the breast to the feet, and is surmounted by a dainty short jacket, the *kabaya*.

Saronno. Town of Italy, in the prov. of Varese. Situated on the rly. between Milan and Como, 13½ m. N.N.W. of the former city, it is a junction, has large lace factories and machine works, and produces the *amaretti* gingerbread which is considered a luxury in all parts of Italy. The pilgrimage church of Our Lady contains frescoes representing a concert of angels, by Ferrari, and others by Luini (*q.v.*), and has a campanile built in 1516.

Saros. In astronomy, a period of 18 years 11½ days, which roughly marks a cyclical period of eclipses both of the sun and of the moon, and enables them to be predicted. It is a period of 223 lunations, and is less than 19 eclipse years by eleven hours. This is the period of the retrograde revolution of the nodes. It was used in very ancient times to predict eclipses. Saros, in Babylonian numeration, was the number 3,600. See Eclipse.

Saros OR XEROS, GULF OF. Inlet of the Aegean Sea, the ancient Sinus Melas. Situated N.W. of the peninsula of Gallipoli, which separates it from the Sea of Marmara and the Dardanelles (*q.v.*), its length is 40 m. and its width at the broadest about 20 m.

Saroyan, WILLIAM (b. 1908). American playwright. Born at Fresno, Calif., Aug. 31, 1908, he was educated there. In 1934 he was acclaimed as a writer of vitality and originality with *The Daring Young Man on the Flying Trapeze*. Turning

for some years to the theatre, he wrote plays which were surrealistic in treatment and provoked controversy. In 1939 came *My Heart's in the Highlands*, and *The Time of Your Life* (this was awarded the Pulitzer prize, rejected by the author); in 1941, *The Beautiful People*. Saroyan opened his own theatre in New York in 1942. A story, *The Human Comedy*, was filmed. The *Adventures of Wesley Jackson*, a novel based on a soldier's letters, appeared in 1947



W. Saroyan, American playwright

Sarpedon. In Greek legend, a prince of the Lycians. He came to fight for the Trojans at the siege of Troy, but was slain by Patroclus, the friend of Achilles.

Sarpi, PAOLO (1552-1623). An Italian historian. Born in Venice, Aug. 14, 1552, he was given the name of Pietro,



Fra Paolo Sarpi, Italian historian

but on becoming a member of the Augustinian order called himself Fra Paolo. He devoted himself to scientific studies, and his reputation long

rested mainly upon his experiments and researches in optics, anatomy, and other sciences. When Paul V attacked Venice in 1606, Sarpi came forward as champion of the Venetian republic against the pope, meeting the papal interdict with a series of polemical tracts and pamphlets. Called to Rome to answer for his conduct, he refused to obey, was excommunicated, and in 1607 an almost successful attempt was made to assassinate him. Undeterred by the attacks of his enemies, he continued his work as a patriot and reformer, being state counsellor in jurisprudence at Venice. He died Jan. 15, 1623.

Sarpi's chief work is the *History of the Council of Trent, 1619*, translated into English by Sir N. Brent, 1620, which gives him a position among Italian historians immediately after Machiavelli. Sarpi has been summed up as a Catholic whose creed approached without quite attaining the Protestant standpoint; he opposed the papal claim to infallibility.

Sarpsborg. Town of Norway, in the fylke of Østfold. It stands on the river Glommen, near its entry into Oslo Fjord, 68 m. by rly. S. by E. of Oslo. The river here forms the huge falls of Sarpsfos, which supply water-power to numerous sawmills, cellulose, paper, and calcium carbide factories, and electrical works. A large quantity of timber is exported. Pop. 13,000.

Sarrail, MARCEAU PAUL EM-MANUEL (1856-1929). A French soldier. Born at Carcassonne, April 6, 1856, he joined the army in 1874, served in Algeria, and became a lieutenant in the foreign legion in 1882.

He was director of infantry under the minister of war in 1907, general commanding the 12th

infantry division, 1911, and successively head of the 8th and 6th army corps. Shortly after the outbreak of the First Great War he was given command of the 3rd army and took part in the first battle of the Marne. In Aug., 1915, he was appointed commander of the French army of the Orient, and next Jan. put at the head of the whole Salonica expedition. Sarrail was high commissioner in Syria from 1923, but in 1925 was recalled after dealing brutally with the revolt of the Jebel Druses. He died March 23, 1929.

Sarre. French name for the river described in this work as Saar. Names of towns in the Saar Basin or Saarland are given the prefix Sarre in French, e.g., Sarrebruck, Sarrelouis, but the German form (e.g. Saarbrücken) is preferred in this work, except for places in Alsace-Lorraine.

Sarreguemines OR **SAAR-GE-MUND.** Town of Lorraine, now in the French dept. of Moselle. It stands at the junction of the Saar and the Blies, 40 m. E. of Metz. It manufactures pottery, velvet, gloves, etc., and is a rly. junction. The town is said to have grown up round an abbey founded by Pepin in the 3rd century. Pop. 13,375.

Sarrusophone. Name of a family of brass wind instruments invented in 1863 by Sarrus, a French army bandmaster. They have a conical bore and are fitted with a double reed, while the mechanism is akin to that of the bassoon. The compass is two octaves and a fourth.

Sarsaparilla (*Spart. zarzaparrilla*, from Basque *zartzia*, bramble). Product of several species of smilax, woody vines, natives of warm parts of America. The roots of the plant are dried, and from them by boiling is prepared the cooling drink, which is bright pink in colour. See Smilax.

Sarsen Stones OR **GREY-WETHERS.** Name given to blocks of hard siliceous sandstone found in Wiltshire and S.E. England. Huge blocks of sarsen stones are scattered in thousands over the Wiltshire downs, the most remarkable being the outer circle of Stonehenge and the stone circle of Avebury. The stone is extremely hard and weather-resisting, and is consequently used in building, especially for stair work, for posts, etc. Windsor Castle is largely constructed of sarsen stones.

Sarsfield, PATRICK (1645-93). Irish soldier. Born near Dublin, of a landowning family, he entered

the English army in 1678 and served in France. He was actively loyal to James II during his short reign, and when the king fled to France Sarsfield was one of his companions. He was in the force that crossed to Ireland to fight for the exiled king. Present



Patrick Sarsfield,
Irish soldier
Franciscan Library,
Dublin

at the battle of the Boyne, he won renown by conducting the defence of Limerick, on the surrender of which city in 1691 he returned to France. Serving in the French army, he was mortally wounded at the battle of Neerwinden, July 29, 1693. James II made him earl of Lucan, and his widow married the duke of Berwick. *Consult* Life, J. Todhunter, 1895.

Sarsnet OR **SARACENET.** Soft, fine silk stuff, plain or twilled, in various colours, now used mainly for lining dresses. It is the old "Saracen cloth," originally made by the Saracens. It seems to have been introduced into England in the 13th century, and was popular as a woman's dress material and lining in the 18th century.

Sartain, JOHN (1808-97). Anglo-American engraver. Born in London, Oct. 24, 1808, he studied engraving under J. Swain. Emigrating at 22 to the U.S.A., he introduced mezzotint engraving to that country, and, settling at Philadelphia, rose to eminence in his profession. Sartain was also a portrait and miniature painter. He died Oct. 25, 1897.

Sarthe. River of France. It rises near Moulins-la-Marche, in Orne dept., and flows S.S.W., passing Alençon and Le Mans, to join the Mayenne and form the Maine, which falls into the Loire below Angers. Its length is 175 m.

Sarthe. Dept. of France. Formerly part of the provs. of Maine and Anjou, it lies adjacent to the depts. of Eure-et-Loir, Loir-et-Cher, Indre-et-Loire, Maine-et-Loire, Mayenne, and Orne. Its area is 2,410 sq. m. Mainly hilly, and well wooded, the dept. produces cereals, especially barley; cattle, sheep, horses, and poultry are bred. The forests of Bèrsay, Vibraye, and Perseigne are here, and marble and building stone are quarried. Industries include motor works, bell foundries, metal working, pottery, bricks, tiles, glass, cloth, preserved foodstuffs,

tanning, paper, and printing. The chief rivers are the Sarthe, Loir, Huisne, and Vègre. Le Mans, the capital, is a rly. centre of importance, and other towns include La Flèche, Mamers, St. Calais, Fresnay-sur-Sarthe, Bonnétable, Bouloir, and Pontvallain. Pop. 412,214.

Sartor Resartus (Lat., the tailor re-clothed). Prose work by Thomas Carlyle, which appeared serially in Fraser's Magazine and was published in book form in 1838 with the full title of Sartor Resartus: The Life and Opinions of Herr Teufelsdröckh. Purporting to be largely a translation of and commentary on the philosophy of clothes as set forth by a German author, it presents, in a remarkably stimulating manner, much pregnant thought on things in general. It was the first work in which the author, to suggest its supposed German origin, hit upon that individual, ejaculatory, and sometimes involved style which later came to be known as Carlylese. The book achieved a remarkable and sustained success—80,000 copies of a cheap edition were sold during 1872-91—and stands as the best single representative of Carlyle's literary style and his philosophic thought.

Sartre, JEAN-PAUL (b. 1905). French man of letters. He was born in Paris, June 5, 1905, and educated at Paris and La Rochelle. In 1930 he became a teacher of philosophy, and before the Second Great War wrote books on philosophical subjects, developing, under the influence of Kierkegaard and Heidegger, his own variety of what became known as Existentialism (*q.v.*), which was to provide the background of all his later work. Mobilised in 1939, he was taken prisoner in 1940, returning to Paris soon and working for the French underground resistance movement. He turned to the drama and the novel in an attempt to gain wider appreciation for his outlook. *Huis-Clos*, 1943 (performed and published in London and New York under the alternative titles *Vicious Circle*, and *No Exit*), was a striking beginning to his career as a playwright, and was followed by *Les Mouches*, 1943; *Morts Sans*



J. P. Sartre, French
man of letters

Sépulture, 1946; and La Putain Respectueuse, 1946; all seen in London. Sartre's most striking work of fiction, the trilogy, *Les Chemins de la Liberté*, 1944-47, portrays the dilemma of the individual caught up into power politics. All his works were placed on the papal index, 1948.

Sarum. Latin name for Salisbury. Old Sarum is a parish 2 m. N. of Salisbury, Wilts, once a city of importance. Occupied in late-Celtic, perhaps in Neolithic times, it became a Saxon burgh, a Norman stronghold, and a medieval city, and returned two parliamentary members down to 1832. Carved out of a chalk knoll 300 ft. above the Avon, the central mound was encircled by a plain, protected by an oval earthwork enclosing 27½ acres. The Romano-British *Sorbiodunum*, commonly identified with the mound, probably occupied the adjacent Stratford-sub-Castle. The Sherborne see was transferred thither in 1075; the office-books called the *Sarum Use* (v.i.) were compiled there about 1085; and its population migrated to Salisbury in 1227. Vested in the office of works as an ancient monument, it was excavated from 1912 onwards. *See Earthwork; Port Way; Salisbury.*

Sarum Use, THE. Customs or rules followed anciently in the English diocese of Salisbury, especially in connexion with the celebration of the Mass. Drawn up by Bishop Osmund in the 11th century, and adopted by the province of Canterbury in 1542, it forms the chief basis of the English Book of Common Prayer. *See Breviary; Liturgy; Missal; Prayer Book.*

Sarzana. City of Italy, in the prov. of Spezia. It stands near the river Magra, 8 m. by rly. E. of Spezia. Its handsome Gothic cathedral, 1255-1474, is built of white marble, and was founded in memory of Pope Nicholas V, a native. During the Second Great War it was damaged by shellfire. Other striking structures are the castle of Sarzanello and the Palazzo del Capitano. There is trade in wine, oil, and silk, and glass bottles and bricks are manufactured. Sarzana is built on the site of the ancient Luna. In 1814 it was ceded to the kingdom of Sardinia, to which it belonged until it was merged in the kingdom of Italy in 1861. Pop. est. 15,000.

Sasaram. Town of Bihar state, India, in Shahabad dist. Formerly a great junction on the Calcutta road, now a rly. junction, it is situated W. of the Son about

midway between Benares and Gaya, near the Kaimur Hills. It was named Sasaram Nasir-ul-Hukkam, the loyal town, by government edict, after the defeat by the citizens of a rebel band in the Mutiny, 1857. The mausoleum of Sher Shah, usurping Afghan emperor of Delhi, 1540-45, stands on an island in a lake, and is a good specimen of Pathan architecture. Pop. 22,308.

Sasebo or **SASEHO.** Naval port of Japan. It stands on the W. coast of the island of Kyushu, and is connected by rly. with Yatsushiro, Kokura, and Nagasaki. The third Japanese naval station in importance, Sasebo was founded in 1886. U.S. aircraft dropped some 1,000 tons of incendiary bombs on this port, June 28, 1945. Pop. 185,900.

Sash (Arab. *shash*, muslin turban). Broad band of silk or similar material worn round the waist or over the shoulder as a part of the costume of women and children, and as part of the insignia of office or of uniform. In the British infantry, except in rifle regiments, officers and sergeants, when in full dress, wear a crimson sash, originally intended as the means by which a wounded man could be carried off the field by two bearers. In 1743 the officers wore the sash over the right shoulder; later it was worn round the waist in most regiments. In 1855 it was worn over the left shoulder by officers, and the right shoulder by sergeants but in 1902 the officers reverted to wearing it round the waist, sergeants continuing to wear it over the right shoulder. *See Uniform.*

Sash. Separate member of a window, carrying the glass. In the sash-and-frame window a pair of sashes are arranged to slide vertically one over the other in a boxed frame. In other forms of window the sash may be hinged at top or side, or fixed. *See Window.*

Sasine (Fr. *saisir*, to occupy). In Scots law, a word formerly used for the act of taking possession of land. This was done by handing a

symbol, such as a clod of earth, to the new possessor, and the deed was recorded in a document signed by the parties concerned. This method was abolished in 1845. Transfers of land are now registered in the sasine office. In England the feudal equivalent was *seizin*.

Saskatchewan (Cree, rapid river). River of Canada. It is formed by two streams, the N. and the S. Saskatchewan. The former rises in the Rocky Mountains and flows E., receiving the Battle, Clearwater, and other streams. The latter is a union of the Bow and Belly rivers, which unite some miles W. of Medicine Hat in Alberta. This, too, flows E. and receives the Red Deer. The two Saskatchewanes unite near Prince Albert, and the joint stream discharges through Lake Cedar into Lake Winnipeg. It is navigable from Edmonton to its mouth. To the head of Bow the length of the river is 1,205 m., but the united river is only about 300 m.

Saskatchewan. Province of Canada. Its area is 251,700 sq. m. of which 13,725 sq. m. are water.

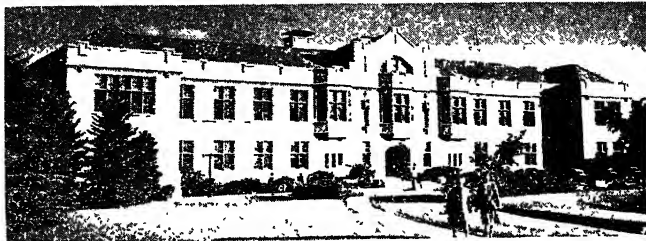
Its name is taken from its main river system, two branches of which cross it. It became a province in 1905, being formerly part of the N.W. territories. Regina is the capital.

Saskatoon is the seat of the university, and other important cities are Moose Jaw, Prince Albert, Battleford, Swift Current, Weyburn, and Estevan.

Two-thirds of the province is part of the grain-growing central plains and the remainder part of the forested and mineral bearing Pre-Cambrian shield. The plains form the largest wheat and cereal growing part of Canada, and Saskatchewan in 1947 produced 173,000,000 bushels out of a total crop of 340,767,000 bushels—more than 50 p.c. of all Canadian



Saskatchewan arms



Saskatchewan, Canada. The Convocation Hall of the University of Saskatchewan, at Saskatoon

production. Saskatchewan is the largest single supplier of wheat and flour for Great Britain. In addition to cereals, the province produces livestock, hogs, wool, timber, poultry, furs, coal, petroleum, sodium sulphate, potash, and base metals. The largely uninhabited northern shield is rich in water-power and mineral possibilities, as well as in timber and fresh-water fish. The province is traversed by the main lines of the two Canadian rlys., by the Trans-Canada airlines, and by a government-owned bus service. More than two-thirds of the population reside in rural areas, mainly on farms or in small villages. Just under 50 p.c. of the people are of British origin, and there are large groups of Scandinavians, Germans, Ukrainians, and other Slavs.

The government consists of a lieutenant-gov. representing the crown and appointed by the federal government and an elected legislature with a cabinet chosen from the strongest party. Elections are held at not less than five-year intervals. The government has departments under ministers including Provincial Treasury, At-

torney General, Agriculture, Education, Cooperation and Co-operative Development, Public Works, Labour, Natural Resources, Health, Social Welfare, and Municipal affairs. There is also an economic advisory and planning board responsible to the cabinet, which guides the operations of a group of state-owned industries such as the Saskatchewan minerals corporation, telephone company, power commission, clay products, timber board, fish board, insurance company, and other industries or services. The province has an extensive cooperative movement both in marketing and wholesale selling. There is a state-directed health and hospital service to cover all parts of the province and a universal system of free schools. There are 55 members in the legislature. The province elects 16

members of the federal parliament at Ottawa and has six members of the federal senate. Pop. 895,992.

Graham Spry,
Agent-General

Saskatchewan,
UNIVERSITY OF
Canadian university. It was established by the provincial legislature in 1907 to serve as an educational centre for the province. The buildings of the university are at Saskatoon, the site covering 1,640 acres. They include laboratories and library, and there is a large experimental farm. The faculties are arts, science, law, education, music, commerce, agriculture, and engineering. There are hostels for both men and women, and three theological colleges at Saskatoon are affiliated with the univ. See illus. p. 7325.

Saskatoon. Capital and second largest city of Saskatchewan, Canada. It stands on the S. Sas-



Saskatoon, Canada. The main thoroughfare of the city

katchewan river, 470 m. W.N.W. of Winnipeg, on the C.P.R. and the C.N.R., of which it is the mid-western headquarters. Here are the provincial university, agricultural college, experimental farm, and school for training teachers. Cement and chemicals are made; there are machine shops and foundries; trade is done in grain. Only a village in 1900, Saskatoon supported a pop. of 44,829 in 1948.

Sassafras (*Sassafras variifolium*). Tree of the family Lauraceae, native of N.E. America. It



Sassafras. Twig showing fruit and two shapes of leaves; inset, left, single fruit; right, flower spray

has yellow-green twigs and oval leaves, some cut into three lobes, greenish-yellow flowers in short sprays, and blue and plum-like fruit on a red, club-shaped stalk. The twigs and leaves are mucilaginous, and the bark has a spicy aromatic odour. The root and bark have stimulating properties and are used as ingredients in medicine, as well as furnishing a yellow dye. The leaves make Sassafras tea, and are used to thicken soup, while a kind of beer is brewed from young shoots, and the oil extracted from the fruit is used in perfumery.

Sassanids. Name of a Persian dynasty which ruled from A.D. 226 to 651. Within a hundred years of



Saskatchewan. Map of the Canadian province, one of the most fertile grain districts in N. America

the destruction of the great Persian empire by Alexander the Great, a new empire called Parthian, under a dynasty called the Arsacidae, was set up in the regions E. of the Euphrates. This dynasty ruled till 226, when it was overthrown by a Persian chief, Babegan or Ardashir. The dynasty took its name from Sassan, a more or less mythical ancestor of Ardashir. *See Persia.*

Sassari. Northern prov. of Sardinia. It is bounded on three sides by the Mediterranean, and has an area of 4,120 sq. m. The surface is mountainous, but in the fertile portions fish, wine, oil, cereals, and tobacco are produced. and there is some mineral wealth. The capital is Sassari. Pop. est. 350,000. *See Caprera*; *Terranova.*

Sassari. City of Sardinia, capital of the prov. of Sassari. It stands on the river Torres, 12 m. by rly. S.E. of Porto Torres on the Gulf of Asinara. It has a 12th century cathedral, a 13th century church, a 14th century castle, a university founded 1677, and an important museum containing Roman relics. A well-built town, it is surrounded by olive and orange groves. It trades in grain, hides, cheese, and oil. In the vicinity are gold and silver mines. Sassari was ceded by the Pisans to the Genoese in 1288, and was sacked by the French in 1527. Pop. est. 60,000.

Sasseno. Island of the Adriatic Sea off the coast of Albania. It lies at the entrance to the Bay of Avlona.

Sassoon, SIR JACOB ELIAS (1844-1916). British banker and merchant. Grandson of David Sassoon of Bagdad, a merchant who migrated to Bombay in the early part of the 19th century, he was the son of David Sassoon who founded the firm of E. D. Sassoon



Sir Jacob Sassoon.
British banker

and Co. Jacob spent many years in China, and settled in London in 1880. He took a leading part in developing the cotton industry of W. India. A philanthropist, he established the central college of science in Bombay, and was the recognized head of the Jewish community in India. Sir Jacob was made a baronet in 1909, and died Oct. 24, 1916. He was succeeded in the title by his younger brother, Edward Elias (1853-1924), whose son, Ellie Victor (b. Dec. 30,

1881), later became chairman of the family business.

Sassoon, SIR PHILIP ALBERT GUSTAVE DAVID (1888-1939). British politician. He was born

Dec. 4, 1888, and educated at Eton and Christ Church, Oxford, becoming 3rd baronet in 1917 on the death of his father, who was related to the family described in the previous article. The same year Philip became Conservative M.P. for Hythe, and served in the First Great War, acting as secretary to Haig. He then became private secretary to Lloyd George, 1920, and was under-secretary for Air under Baldwin, 1924-29, occupying the same position in the national governments of 1931-37, when he was made first commissioner of Works.

An enthusiastic aeronaut, he toured R.A.F. stations in India, Iraq, Egypt, the Sudan, and Malta by air in 1928, long before such journeys by air were common. It was largely through his influence that the govt. decision, for reasons of economy, not to compete for the Schneider trophy (*q.v.*) in 1931 was reversed. At home he encouraged civil aviation, piloting his own aeroplane. He was from 1932 hon. air commodore in the A.A.F. His private flying field at Lympe became a R.A.F. aerodrome during the Second Great War. A generous patron of art also, he frequently threw open his house in Park Lane for period art exhibitions in aid of the Royal Northern hospital, of which he was chairman. He was a trustee of the National Gallery, Wallace Collection, and Tate Gallery. He died June 3, 1939.

Sassoon, SIEGFRIED LORRAINE (b. 1886). English poet and writer. Related through his



Siegfried Sassoon,
English poet

mother to the Thornycroft engineers and sculptors, he was born Sept. 8, 1886. A youth passed in Kent provided the background for *Memoirs of a Fox-Hunting Man*, which first brought him into public notice in 1928 and gained the Hawthornden prize next year. Infantry service in the First Great War, including a

revulsion which led him to try to throw up his commission, was to be chronicled in *Memoirs of an Infantry Officer*, 1930; it also evoked poems, some of bitter invective, others expressing the strange beauty of quiet moments in the din of conflict. The trilogy of memoirs of "George Sherston" was completed in 1936 with *Sherston's Progress*. Autobiography, *The Weald of Youth*, followed in 1942; *Siegfried's Journey*, 1945. He published a biography of Meredith in 1948. Sassoon's prose has an easy flow, even when he is satirical. His poems were collected in 1947; those previously published as *The Heart's Journey* especially reveal his sensitive nature, and some have been set to music. Everyone Sang is an anthology piece, and All Souls' Day a magnificent affirmation of faith.

Sastri, SRINIVASA (V.S.) (1869-1946). Indian politician. A Brahman, he was born at Valangimann, near Kumbakonam, Madras, Sept. 22, 1869, and was a pupil of the government college there. He became head of the Hindu high school, Triplicane, 1899. A leader of the moderate reformers, he represented Madras on the viceregal legislative council, 1916-20, and on the council of state in the Indian legislature, 1921. A notable orator, he spoke for India at the imperial conference of 1921, and at the L. of N. assembly. In 1927 he became Indian government agent in S. Africa. Sastri received the C.H. in 1930. He was vice-chancellor of Annamalai university, 1935-40. He died April 17, 1946.

Satan. One of the many Hebrew names given to the prince of the powers of darkness. Satan means literally an adversary, a hindering influence, and though most authorities hold that Our Lord is represented as expressing belief in Satan as a personal being, some think that He accommodated His language to the popular Hebraic mode of expressing the power of evil. The idea of a supreme evil spirit, the Devil or Satan, came into prominence among the Jews about the time of the captivity. Milton, in *Paradise Lost* and *Paradise Regained*, did much to establish modern belief in a personal cause of the Fall and of the moral evil of the world. *See Devil.* Consult art. Satan, in *Hastings's Dictionary of the Bible*, 1904.

Satan-Worship. Ritual reverence of the devil as the personalised ruler of the powers of evil. Involving the principle of moral evil, it is distinguishable from the pro-

pitiation of malignant spirits which pervades animistic religions. It differs also from the devil-worship of the Yezidis, who venerate the arch-enemy in the belief that such friendliness, offered to him while a fallen angel, will be rewarded when he regains paradise. The worship of Satan as almighty and supreme finds no place in the history of religion.

Late in the 19th century there were declared to occur in France and elsewhere persons who, unable to perceive beneficent omnipotence in the government of the universe, deliberately defied the Supreme Being by offering allegiance to his adversary. This perverted cult, called Satanism, was short-lived.

From 1885, a voluminous literature, mostly emanating from Paris, alleged the widespread existence of a powerful cult, alternatively called Palladism or Luciferism. Declared to have been founded by Albert Pike at Charleston, U.S.A., whence it spread to Europe, it was described as an integral part of Continental masonic ritual, marked by a revival of the indecencies of the Black Mass. Gabriel Jogand, under the pen-name Leo Taxil, after professing conversion to Rome, and a German confederate, Hacks, under the pen-name Bataille, published elaborate "revelations" which were eagerly accepted by a credulous public. During 1896-97 the confederates confessed the whole thing to be a hoax.

Satara. District and town of India, in the Central division, Bombay state. The district lies to the E. of the W. Ghats. It is crossed by the rly. S. from Poona. Food grains and pulses are the chief crops. The town 2,300 ft. above sea level, is 55 m. S. of Poona on the main road from Poona to Belgaum. It has monuments of the Mahratta age and the famous sword of Sivaji. Brass ware is manufactured. Area of dist. 4,891 sq. m. Pop., dist., 1,327,249; town, 22,454.

Satellite (Lat. *satelles*, attendant). In astronomy, a companion body to a planet or star. According to a theory of their formation, the planets, before being completely cooled, and while still rapidly rotating semi-liquid bodies, threw off their satellites, which, however, had not sufficient speed of direct motion to escape from the attraction of the parent body. The inner planets, Venus and Mercury, have no satellites; the earth one, the moon; Mars two: Jupiter eleven; Saturn, in addition to its rings, nine; Uranus, five; Neptune, one.

Some of the satellites, e.g. that of Neptune, have a retrograde motion. The moon is the largest satellite relative to its planet. Many stars have dark satellites, and others companions only a little less bright than their primaries. See Planet; Star.

Satellite Town. Town the growth and economic life of which depend principally on another town or city, e.g. Leith, the port of Edinburgh. The satellite towns that served London in the 18th and 19th centuries, e.g. Tottenham, Islington, Hammersmith, Clapham, and Camberwell, have all been absorbed into London, as the built-up area has spread from within the 5-m. to

Following the issue of the Barlow and Scott Reports (*qq.v.*), the New Towns Act, 1946, authorised the establishment in the British Isles by development corporations appointed and financed by the govt. of new satellite towns to relieve pressure of pop. on existing towns. See Town Planning; consult Garden Cities of Tomorrow, E. Howard, 1902; A Plan for Town and Country, P. Pool and F. Stephenson, 1944; Report of New Towns Committee (Cmd. 6876), H.M.S.O., 1946.

Sati or Sutttee (Hind., virtuous wife). Hindu widow who immolates herself on her husband's funeral pyre, or is separately immolated when he has died at a



Sati or Sutttee. Scene at the burning of a Hindu whose widow is being immolated on the funeral pyre as an act of virtue

From an old print

beyond the 10-m. radius; and London's present satellites include many of the towns of the home counties, which depend for their prosperity on residence in them of people working in London.

Sir Ebenezer Howard proposed in 1898 that new satellite towns or garden cities should be built as an alternative to the sprawl of the great cities, such as London and Birmingham. Such cities would not be dormitory towns, but would be planned as complete cities with industries of their own, becoming social units large enough to afford all the amenities of city life, yet small enough to be in close relation with the surrounding countryside. The first garden city, Letchworth, was so planned and begun in 1903, the development being in the hands of a corporation, which was the landowner. Letchworth attracted to itself numerous industries, so that the majority of its residents work locally. Welwyn Garden City, established in 1920 as a satellite town 21 m. from London, also has local industries, but a greater proportion of its residents work in London.

The act itself is properly called sahamarana, accompanying-in-death, or anamarana, following-in-death; in ordinary European usage the word sati denotes the act as well as the victim.

Unknown in Vedic times, widow-burning was recorded by ancient historians of Alexander's Indian campaigns. Revived in the 6th century A.D., it was fortified by the alleged example of Siva's consort, hence called Sati. Akbar forbade compulsory sati, and self-immolation was deprecated by Sikh teaching. It continued unabated, especially in N. India; on the death in 1710 of a Marava prince, his 47 widows performed sati, and in 1817 the Bengal presidency recorded 700 cases. After its abolition by law in British India in 1829 it dwindled rapidly, but lingered longer in the native states, being performed by several widows of Sir Jung Bahadur of Nepal in 1877. Since that date it has become virtually extinct.

Widow-burning is related to a primitive custom, still observable in negro Africa, of providing necessary service in the afterworld

by sacrificing women and slaves. Early Aryan practice led to its widespread occurrence in Europe, as with the Greek Evadne and the Norse Brunhild. Julius Caesar mentioned it in connexion with Gaulish chieftains, a Yorkshire barrow apparently confirms it for Bronze Age Britain, and it was practised by the Slavonic Wends. Hindu colonists carried it to Malaysia, and it is traceable in aboriginal N. America.

Satie, ERIC ALFRED LESLIE (1866–1925). French composer. Son of a music publisher and composer, he was born at Honfleur, Calvados, March 17, 1866, and studied at Paris conservatoire. In 1889 he produced *Ogives*, which included *Gymnopédies* and *Gnosiennes*. During this period he wrote waltz songs for the music-hall singer Paulette Goddard, and in 1890 became friendly with Debussy (who orchestrated two of the *Gymnopédies*). Many of his pieces had literary titles, e.g. *Pièces en forme de poire*, *Choses vues à droite et à gauche*, *Véritables préludes flasques* (for a dog). Later works included the ballets *Parade*, 1917 (performed by Diaghilev's company), *Relâche*, 1924, and a symphonic drama in 3 parts, with voice, on Plato's dialogues.

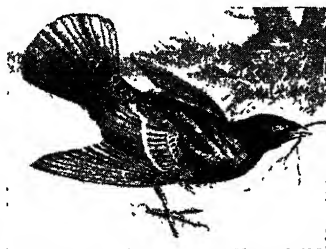
Satie, who became a member of the group Les Six in Paris after the First Great War, was a pioneer in polytonality. Paradoxical, an exhibitionist, he had a sense of the grotesque, and his music enjoyed a certain vogue in the 1920s. He died in Paris, July 2, 1925.

Satin. Silk or rayon stuff with smooth glossy surface. It was apparently first made in China, and the name may come from the city in China known in the Middle Ages as Zaitun, which produced rich silken fabrics. The word is more generally derived from Latin *seta* (silk). Satin was known in England in the 13th century, but was not made there until the 17th cen-

tury, when the manufacture was introduced by French Protestant refugees. Spitalfields became famous for fine satins. The lustre of satin is produced partly by using silk or rayon of fine quality, partly by a special method of weaving. Sateen is a cotton fabric woven by the same method as satin.

In the weaving of satin and sateen the great majority of the warp in the former case and the weft in the latter, is on the face of the fabric; when carefully manufactured satin shows no pattern and appears perfectly smooth, though its construction follows the lines of twill. This absence of pattern is chiefly accounted for by the fine silk or rayon threads used for the warp, the coarser and stronger threads of the weft being fewer in number. In the manufacture of damask a mixture of satin and sateen weaving is carried out, as there are certain preponderances of warp and weft threads, and these provide the characteristic pattern of damask (*q.v.*). Satin-stitch is a form of parallel stitches set closely together and giving the effect of a sheen or lustre.

Satin Bird (*Ptilonorhynchus violaceus*). Species of bower bird. It is related to the birds of paradise.



Satin Bird, the delicately shaded species of Australian bower-bird

The feathers of the forehead have a very silky or satin-like lustre. The birds occur in N. and E. Australia, and construct bowers or playing grounds, which they ornament with twigs, pebbles, land shells, etc.

Satin Spar. Name given to compact fibrous varieties of calcite and gypsum. Both have a satin-like lustre which is well brought out by polishing.

Satinwood (*Chloroxylon swietenia*). Tree of the family Rutaceae. It is a native of India. The leaves are divided into two rows of numerous oval leaflets; and the small, whitish flowers are in large clusters. The wood is close-grained, hard, and of a yellow tint, with a satiny lustre. It is used for veneers, the backs of brushes, turnery, etc.

Satire (Lat. *satura*, medley). In literature, the exposure of vice or folly prompted by indignation. As such it ranges from lofty denunciation of the wickedness of an age to scornful reflection upon the defects of an individual, and equally includes lengthy and elaborated compositions in verse or prose, and the sententious brevity of an epigram. All passions come within its purview, but its concern is with the abuse of these, and its function is destructive criticism. As a picture of living manners satire has enduring interest, but as a substantive form of literary art it is marred by its essential uniformity of censure.

Satire as a literary form has been known since very early times. Archilochus of Paros (*fl.* c. 700 B.C.) and Simonides of Amorgos, at about the same period, were both exponents of the satiric form of poetry. Both adopted the iambic metre for it. In Italy, however, satire found its most congenial soil. Originating in the crude drama of the peasantry, it was given regular poetic form by Ennius, and later was cultivated to a high degree of perfection by Lucilius, Horace, Persius, and Juvenal. Writing in the orthodox hexameter form, these men produced vigorous criticism of contemporary life, each stamping his work with his own character. They set, moreover, what was to remain the standard of classic satiric verse, in conformity with which poets of different blood and later ages were to produce didactic poetry of high dignity and moral usefulness, its splendid scorn of vice and folly emphasised by the pungent brevity of its expression.

Martial, Lucian, and Petronius Arbiter made substantive contributions to the material form of satire, the first by epigrams, the second by dramatic dialogues, the third by licentious fiction describing the corrupt pleasures of an effete society. These had their disciples and imitators in later days, but generally the unworthier qualities of their work were most commonly reproduced.

Nevertheless, satire has had its triumphs in the literature of every country. The 17th and 18th centuries were its flowering time in Europe. Then, as Pope put it, wit grew polite; poets learned to preserve freedom and forbear vice; and satire rose to hit the happy medium and heal with morals what it hurt with wit. In England, Pope himself, with Dryden and Swift, and, before them, Donne; in



Satinwood. Divided leaves and, inset, left, flower-spray; right, flower

France, Boileau, Molière, and Voltaire; in Spain, Cervantes; and in Germany, Richter and, later, Heine; these men are true satirists, truly virtuous in that nothing was so hateful to them as hypocrisy, and true poets in that they ennobled invective into allegory. Consult Rise of Formal Satire in England, R. M. Alden, 1899; English Satires, O. Smeaton, 1899; English Satire, ed. N. Furlong, 1946.

Satire Ménippée. French satire. It was named after the *Saturae Menippeae*, which were written by Varro in imitation of the writings of the Greek cynic Menippus. The *Satire Ménippée* was written in 1593 and published at Tours the next year. The writers were P. Le Roy, J. Paserat, F. Chrestien, N. Rapin, and P. Pithou. In a medley of jests, epigrams, and parodies in prose and verse, they ridiculed the League and its promoters, the Guises, and effectively supported the claims of Henry IV of France.

Satpura. Mountain range of India. It lies E.-W. between the Narbada and Tapi rivers, falling partly within the Madhya union and mainly in the Khandesh div. of Bombay state. The average height is 3,000 ft.

Satrap. Provincial governor under the ancient Persian empire. He was responsible only to the Persian king, and was possessed of absolute power in his own territory. The word in modern usage denotes a petty tyrant.

Satsuma. Small group of islands off the S.W. coast of Kyushu Island, Japan.

Satsuma Ware. Noted Japanese ware. Satsuma faience of soft paste was first made in 1598 by Japanese workers, who had learnt their craft in Korea. This type had green, yellow, black or parti-coloured (flambé) glaze. A second, Satsuma-Tangen, had a vitrifiable glaze. The third type (end of the 18th century) had a hard paste, and was decorated with diaper patterns, flowers, and Japanese mythological creatures. A fourth type, with hard white paste, was decorated in colours and gold, also with yellow, black, olive-green, or mustard-yellow glazes.

Satul Mare (Hung. Szatmar Nemeti). Town of Rumania. It stands on the right bank of the Samos, 63 m. N.E. of Debreczen. The town was founded by Germans in the 11th century. An important rly. junction, it lay in N. Transylvania, given to Hungary by the Vienna award of 1940. The Russians took it by storm from its

German occupiers Oct. 25, 1944. By the peace treaty with Rumania, 1947, it reverted to that country. Pop. 56,006.

Saturation. State when the limit of capacity is reached for one body to be filled with another. This amount depends upon both the solute and the solvent, and generally increases with the temperature, e.g. 100 gm. of water can dissolve 197 gm. of cane sugar at 15° C. and 487 gm. at 100° C., but only 36 gm. and 40 gm., respectively, of common salt at these temperatures. By carefully cooling a hot saturated solution it is possible to prevent the solute from precipitating, and supersaturation results. Ordinary gases such as oxygen, nitrogen, etc., or their mixture, air, are usually unsaturated. A volume of air is said to be saturated with water vapour when, on exposure to a flat surface of water or ice, just as many molecules of water vapour penetrate the surface as pass into the air, i.e. at the particular temperature the vapour is in equilibrium with its liquid. Under normal conditions of saturation air at 100° F. (38° C.) can hold about ten times as much water vapour as a similar mass of air at 32° F. (0° C.). Below freezing point the saturation vapour pressure over a supercooled water surface is greater than that over ice at the same temperature.

Saturday. Seventh day of the week, named from the planet Saturn, to which the day was dedi-

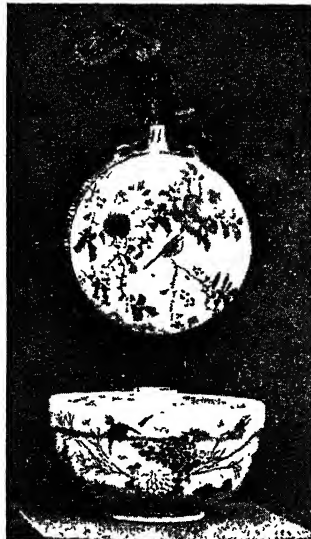
cated by the Romans. Saturday is the Jewish sabbath. Holy Saturday is the day before Easter. The Saturday half-holiday was a very old institution in England, dating back to the reign of Henry III. It fell into abeyance, and was re-introduced about 1854 by Sir Richard Tangye, and became general in 1860. See Early Closing.

Saturday Review. THE. Former British weekly journal. It was founded by A. J. B. Beresford-Hope, Nov. 3, 1855, and its first editor was John Douglas Cook, 1855-66. For many years it maintained a high literary standard, its contributors including E. A. Freeman, Mark Pattison, John Morley, G. Saintsbury, Max Beerbohm, and Frank Harris, who was its proprietor during 1894-98. Its dramatic criticism included contributions by Bernard Shaw, 1895-98. A later editor was Gerald Barry, 1924-30. It was bought by Lady Houston in 1934. Under the editorship of J. Wentworth Day its broad Liberal outlook then disappeared, and it became a paper representing the extreme right wing of Conservatism. Within a year it ceased publication.

Saturn. In classical mythology, Italian god of agriculture. According to a popular legend, Saturn was an ancient king of Latium, whose reign, being a time of great happiness and prosperity, was the so-called Golden Age (q.v.). Saturn was subsequently identified with the Greek Cronos, and the repulsive story relating to that god is associated with him. See Cronos.

Saturn. In astronomy, the next outward planet to Jupiter of the superior planets. Its mean distance from the sun is 887,100,000 m., and its equatorial diameter 74,200 m. The planet is lighter than water and is the least dense of all the planets. The time occupied in its yearly path about the sun is 29.46 years, and the time of rotation at the equator 10 hours 14 mins. 23 secs. The time of revolution depends upon the latitude, observation of two remarkable white spots which appeared in temperate latitudes of the planet in 1903 giving a period of 10 hours 39 mins. 21 secs. The spectrum of Saturn shows that its atmosphere contains large quantities of methane and ammonia.

Saturn's conspicuous feature is the ring, or rings, the inconsistent appearance of which startled Galileo, their discoverer, until improved telescopes explained the appearances and disappearances of this remarkable feature of the planet. Hardly visible edgeways,



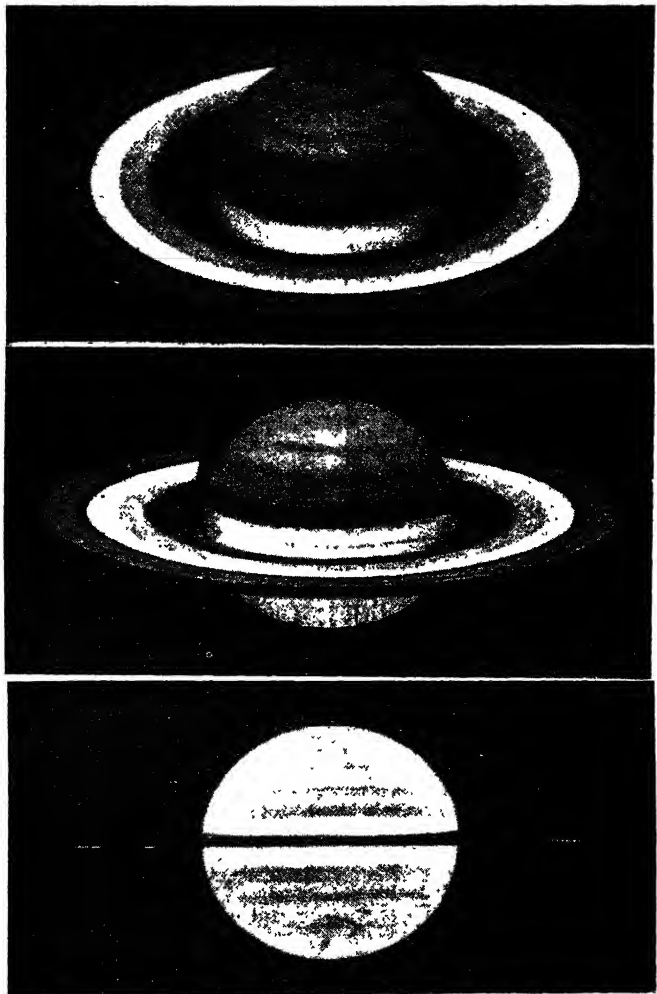
Satsuma Ware. Bottle slung on cord, and bowl, of the Japanese faience ware
Victoria and Albert Museum

the ring system was thought, till the middle of the 19th century, to be a solid body or bodies. But in 1857 Clerk Maxwell proved mathematically that the rings must consist of an aggregation of fine particles revolving independently, with periods determined by their distances from the planet. The ring system is situated in the plane of the planet's equator, and consists in chief of two bright outer rings, one within the other, separated by what is called Cassini's division, from its discoverer, and an inner dark ring called the crape ring. There are other gaps and subdivisions less conspicuous. The outside diameter of the outer ring is 171,000 m.; and the breadth of this flat ring is 10,000 m.

Then comes Cassini's gap of 3,000 m. The inner bright ring is broader than the outer one, 16,000 m. The crape ring which melts into it is 11,500 m. broad, and there is a gap of 7,000 m. between the crape ring and the planet. The appearance of the crape ring has been explained as due to its being composed of particles similar to those in the bright outer rings, but less thickly strewn, so that the dusky appearance is due to continuously recurring shadows. Evanescent markings or divisions in the bright rings testify to the unequal rotation, and slight irregularities in the shape of the rings, and of the shadow which the planet casts upon them, show that the orbital planes are not all the same. The inner dusky ring is transparent, *i.e.* sunlight passes through it. Maxwell's theoretical conclusion that all the rings consist of aggregates of tiny moons or particles each moving independently in its own orbit round the planet, was verified observationally in 1895, when Keeler showed spectroscopically that the outer parts of the rings travel more slowly than the inner, and that the innermost portions travel about twice as fast as Saturn rotates.

The thickness of this ring system is probably not more than 50 m., and may be as little as 10. The small particles composing the rings are probably the remnants of a former satellite which approached within Roche's Limit (*q.v.*), and was broken up by tidal forces.

Saturn has nine satellites. Mimas, which revolves at a mean distance of 115,400 m. and was discovered by Herschel in 1789; Enceladus (148,000 m., Herschel, 1789); Tethys (183,200 m., Cassini, 1684); Dione (234,700 m., Cassini, 1684); Rhea (327,800 m., Cassini,



Saturn. Diagram showing (top to bottom) phases in the position of the rings of the planet as they appeared to change over a period of fifteen years

1672); Titan (759,900 m., Huygens, 1655); Hyperion (922,000 m., Bond, 1848); Iapetus (2,213,000 m., Cassini, 1671); and Phoebe (8,044,000 m., Pickering, 1898). The discovery of another (Themis) was announced by Pickering in 1905 but has not been confirmed. Phoebe is remarkable for its retrograde motion: this and its great distance from Saturn make it possible that it is a captured asteroid. In 1944 the largest satellite, Titan, was found to have an atmosphere similar to Saturn's.

Saturnalia. In ancient Rome, the annual festival of Saturn. Originally a rustic merry-making of unknown antiquity, probably celebrating the winter solstice, it was kept under the republic on Dec. 19, extended by Augustus to

three days, Dec. 17-19, and later to a week. Schools and law courts were closed. Slaves enjoyed freedom of speech and temporary liberty, and were waited on by their masters. The term is figuratively applied to any occasion of unbridled riot or crime.

Saturninus, LUCIUS APPULEIUS (d. 100 B.C.). Demagogue of ancient Rome. He allied himself with the great popular leader, Gaius Marius. As tribune in 100 B.C., he was responsible for a measure reducing the price of corn and providing for the distribution of land among the veterans of Marius. Associated with him in these schemes was another demagogue named Glaucia. These measures brought their authors great popularity, but the murder of Mem-

mius, a rival of Glaucia, caused a reaction, and in the disturbances which followed the two demagogues were killed by hot-headed young nobles. Marius had been called upon by the senate to maintain order, and was powerless to save them.

Satyr. In Greek mythology, minor nature deity. They were chiefly found in attendance upon



Satyr. Fabulous nature deity as represented in ancient sculpture
British Museum

the god Bacchus. Of repellent appearance, with pointed goat's ears, horns, and a tail, they were addicted to wine and licentiousness. The Roman poets confused them with the Fauns.

Sauckel, FRITZ (1894-1946). German Nazi leader. A Bavarian, born Oct. 27, 1894, at Hassfurt, he ran away from school to sea, and became a British prisoner of war in 1914. A locksmith, he took up Nazi politics at their beginning, and by 1927 was *Gauleiter* for Thuringia. State premier in 1932, he was confirmed in office by Hitler, who in 1942 chose him dictator of manpower. For the crimes against humanity which he committed in occupied territories, Sauckel was indicted as a principal at the Nuremberg trials, and was hanged on Oct. 16, 1946.

Saud, IBN. The ruler of Saudi Arabia is described in this Encyclopedia as Ibn Saud.

Saudi Arabia. Kingdom which covers the greater part of Arabia and is described in the article on that country.

Sauerkraut (Ger., sour cabbage). Preserved, salted cabbage, a staple article of food in Germany and parts of N. Europe. Both red and white cabbages are used, but

chiefly the latter. The outer leaves are discarded, and the cabbages finely shredded and placed in a barrel in layers, with salt and often condiments between. When the barrel is full, the whole is pressed down with a heavy weight till white globules appear on the surface, showing that fermentation is taking place. When a crust forms the sauerkraut is ready for use. It makes a good garnish, and is usually boiled and may be braised. *Pron.* sour-crowt.

Saugor OR **SAGAR.** District and town of the Madhya union, India, in the Jubbulpore division. The dist. is the most N. in the province, lying N. of the Vindhya ranges on the Malwa plateau at an average alt. of 2,000 ft. There is some black cotton soil and the rainfall is 46 ins.; cotton and wheat are the chief crops. A third of the area is under tillage, and another third could be cultivated. Area 6,761 sq. m. Pop. 939,068.

Saugor town is the largest trading centre in a considerable area, and is served by rly. Its fort, with 20 round towers, was completed by the Mahrattas in 1780. A cavalry school was founded here in 1910. Saugor is nearly 2,000 ft. above sea level on the border of a lake, has wide streets and fine facilities for bathing. Pop. 50,700.

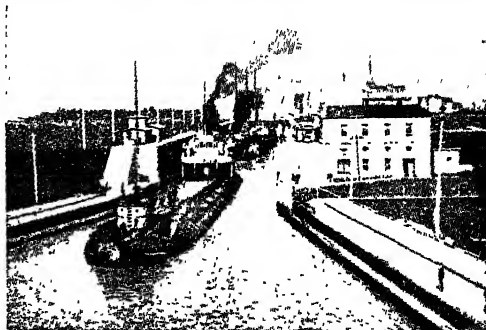
Saul (d. c. 1010 B.C.). First king of Israel. The son of Kish, of the tribe of Benjamin, he delivered Jabesh-Gilead from Nahash, king of Ammon, and was made king at Gilgal. Thenceforward his chief task was the struggle with the Philistines. With his son Jonathan, he inflicted a great defeat on them at Gibeah or Geba, and afterwards crushed the Amalekites, but having disobeyed a command to destroy them utterly, received

from Samuel (*q.v.*) the message that Jehovah had rejected him. His insane jealousy drove David (*q.v.*) into outlawry. Finally, the Philistine hosts gathered in the plain of Megiddo, and Saul, abandoned by his religious guides, sought the witch of Endor, and the next day was overthrown at Mt. Gilboa, where his sons were killed, and he fell upon his sword (1 Sam. 8 to 2 Sam. 1). See also Paul.

Sault Sainte Marie. Town of Ontario, Canada. It stands on St. Mary's river, between Lakes Huron and Superior, just opposite the American city of the same name, with which it is connected by a rly. bridge a mile long. It is on the C.N.R. and Algoma Central and Hudson Bay rly. The town owes its importance to its position on the Sault Sainte Marie Canal, and its industries include the making of steel rly. cars, bricks, and chemicals. The name is due to the falls (O.F. *sautier*, to leap) in St. Mary's river. Adjoining it is the new town of Steelton, named from its leading industry. *Pron.* Soosan-mary. Pop. 25,794.

Sault Sainte Marie. City of Michigan, U.S.A. It stands on St. Mary's river, just opposite its Canadian namesake, and is a station on the C.P.R. and several American rlys. Here are St. Mary's Locks, four reservoirs which raise ships 19 ft. from Lake Huron to Lake Superior. It was originally the site of a Jesuit mission and has existed since 1662. Pop. 15,847.

Sault Sainte Marie Canals OR **SOO CANALS.** Ship canals in N. America. The Canadian one was cut to enable big ships to pass between Lakes Superior and Huron, and was opened in 1895. It takes its name from the rapids in St. Mary's river. Since 1855 there had been a ship canal on the American side of the river, and for



Sault Sainte Marie Canals. The great Canadian lock, 900 ft. in length

forty years this was used by Canadian shipping passing through the Great Lakes. Canada, however, was anxious to have her own canal here, and in 1888 it was put in hand. A little over a mile long, with 20½ feet of navigable water, it has one immense lock, 900 ft. by 60 ft., which is emptied and filled by electrical power. The American waterway has been much improved since 1907, four

looks larger than the Canadian having been constructed. Both canals are closed by ice for 100 to 120 days each winter, from Dec. to mid-April. No recent figures of traffic are available, but, in 1937, 87,633,600 tons went through the canals, the value being nearly \$1,000,000,000. During the same year the combined tonnage of the Panama, Suez, Manchester, and Kiel Canals was only about 83,000,000 tons.

Saumarez, JAMES SAUMAREZ, BARON DE (1757-1836). British sailor. He was born in Guernsey,



Baron de Saumarez,
British sailor
After Jean

March 11, 1757, and commanded the Russell in Rodney's victory off Dominica in 1782, and the Orion in Bridport's somewhat half-hearted fight off Brest in 1795. He

had the same ship in the victory of St. Vincent and at the battle of the Nile. His greatest success as a flag officer was achieved in 1801, when, after making an unsuccessful attack on a French fleet in Algieras, he engaged a greatly superior Franco-Spanish force and, without material loss, drove it into port short of two ships blown up and one captured. Admiral in 1814, he was appointed vice-admiral of Great Britain in 1821 and raised to the peerage in 1831 on the coronation of William IV. He died in Guernsey, Oct. 9, 1836. *Consull* Life, 2 vols., Sir J. Ross, 1838.

Saumur. Town of France. In the dept. of Maine-et-Loire, it stands at the foot of a hill on the left bank of the river Loire, 30 m. S.E. of Angers. On the riverside in the vicinity of the town are prehistoric caves, with Celtic remains, including the dolmen of

Bagneux, the largest and best preserved Druidic chamber in France. The castle, founded in 1040, is now an arsenal and powder magazine. A famous Huguenot stronghold, Saumur was one of the chief schools of Protestant theology until the revocation of the Edict of Nantes, when it lost its prosperity by the expulsion of many of its inhabitants. In 1793 it was captured, after a great battle, by the Vendéans. Its church of Notre Dame de Nantilly is a pilgrim resort and has splendid tapestries. The town manufactures rosaries, enamels, etc., and has tinplate factories. Here is a cavalry school founded in 1768. Pop. 17,635.

Saumur OR SPARKLING SAUMUR. White, effervescent wine. It is grown in the Loire vineyards, and made at, and matured in the limestone caves near Saumur. It is made in the same way as champagne (*q.v.*), which it resembles in general characteristics, and though not so fine or rich, it is delicate, dry, and of moderate strength.

Saunders, SIR CHARLES (c. 1713-75). British sailor. He entered the navy in 1727, sailed in Anson's voyage round the world, 1740-44, was promoted to the Gloucester, and in 1746 captured a Spanish vessel, his share of the prize money being about £30,000. Com-



Sir Charles Saunders,
British sailor

mander-in-chief of the Newfoundland station, 1752, in 1756 he sailed to the Mediterranean, where he took over command the following year. Vice-admiral in 1759, he transported Wolfe and his troops to Quebec. Knighted 1761, he became first lord of the Admiralty 1766, and died Dec. 7, 1775.

Saunders, HILARY AIDAN ST. GEORGE (b. 1898). British writer. He was born Jan. 14, 1898, and educated at Downside, and Balliol College, Oxford. Secretary to Nansen (*q.v.*) during 1921-23, he was on the secretariat of the League of Nations from 1920 to 1937. He then became assistant

librarian to the house of commons, being promoted to librarian in 1946. During the Second Great War he wrote the official booklet, *The Battle of Britain*, which sold in enormous numbers, and accounts of other aspects of the war effort, *e.g.* *Bomber Command*, 1942, *Combined Operations*, 1943. In collaboration with John Palmer, he wrote many novels under the pseudonym of Francis Beeding; also as David Pilgrim.

Saurashtra, UNITED STATE OF. Name (meaning personal kingdom) given to a state of the Union of India, formed from the former Kathiawar states and inaugurated at Jamnagar, Feb. 15, 1948. It comprised what were formerly 860 different administrative units, including 221 states; the chief former states being Nawanagar, Bhavnagar, Gondal, Porbandar, Dhrangadhra, and Rajkot. The jam sahib of Nawanagar became rajpramukh. Junagadh having joined Saurashtra, Jan. 20, 1949, the union includes almost all the Kathiawar peninsula. Area 21,318 sq. m. Pop. (1950 est.) 3,960,000.

Sauria (Gr. *sauros*, lizard). Obsolete term for an order of reptiles including the lizards and the snakes.

Sauropterygia (Gr. *sauros*, lizard; *pteryx*, wing). Extinct fossil amphibious or aquatic reptiles. Found in Triassic, Permian, Carboniferous, Jurassic, and other deposits, they had small heads, long necks, and short tails, and two pairs of paddles for swimming. Some of the reptiles were over 30 ft. in length.

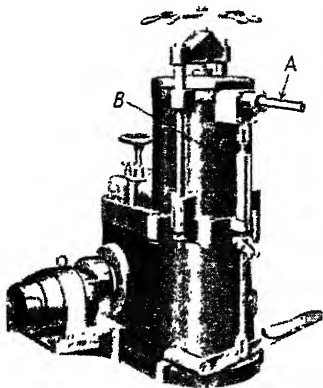
Sausage. Article of food consisting generally of a casing or skin filled with some food mixture. Sausage skins are usually made from the carefully cleaned intestines of sheep, pigs, or cattle, though various synthetic casings are being increasingly used. The internal mixture, or the sausage proper, is made up of meat, bread, or other cereal, seasoned with salt, pepper, spices, and herbs. The meat is usually pork or beef, chopped fine or minced. In the U.S.A. many sausages made from cooked or smoked meat are popular. The Germans invented a great variety of sausages.

In Great Britain sausages are generally made from fresh meat, beef or pork being most usual. Before the Second Great War typical recipes were: (1) Lean pork, 15 lb.; fat, 6 lb.; bread or biscuit powder, 4 lb.; seasoning, 14 oz., and preservative. (2) Lean beef, 12 lb.; beef fat, 8 lb.;



Saumur, France. South front of the 11th century castle, built by the Count of Anjou

bread, 4 lb.; biscuit powder, 4 lb.; with seasoning and colouring matter. During and after the Second Great War, the proportion of meat was decreased, but was



Sausage. A hydraulically operated machine for filling sausages. See text
By courtesy of the Alexander Mfg. Co.

controlled by law. The method of filling is shown in the illustration. The mixture when chopped is placed into a filling machine, and extruded by hydraulic pressure supplied through pipe A to a piston moving vertically in the filling chamber B. The sausage meat is extruded through the nozzle, on to which the casings are fitted, and the meat is forced into the required size of casing.

Saussure, HORACE BÉNÉDICT DE (1740-99). Swiss physicist. Born at Geneva, Feb. 17, 1740, he studied botany, and was professor of philosophy at Geneva, 1762-86. He specialised in the flora and geology of the Alps, was one of the first to reach the summit of Mont



H. B. de Saussure, Swiss physicist
After St. Ours

Blanc, and undertook other climbs for research and scientific observation, the results of which were afterwards published in *Voyages dans les Alpes, 1778-96*. He added greatly to the geological data of the Alps, invented and improved many meteorological instruments, and died Jan. 22, 1799. *Consult* Life, D. W. Freshfield, 1921.

His son, Nicholas Théodore de Saussure, who was born Oct. 14, 1767, and died April 18, 1845, was the first to make a quantitative analysis of plant nutriment.

Sausrurite. In mineralogy, name given to a supposed variety of jade found in the Swiss Alps. It was so named from its discoverer H. B. de Saussure. It is waxy, white to pale green in colour, and is now recognized as resulting from the alteration of such rocks as gabbro. It is a mixture of albite, chlorite, epidote, etc.

Sauterne. French white wine grown in the Sauterne district, S. of Bordeaux. The region, comparatively small, is hilly, and the soil partly cretaceous. Owing to this and to the grapes being well matured and gathered with extreme care, Sauterne is a fuller-bodied, sweeter, stronger wine than Médoc. Of a pale golden tint, it has a clinging taste and distinctive, delicate bouquet. It contains from 9 to 14 p.c. of alcohol, keeps well, and commands high prices. Château Yquem is considered the finest Sauterne.

Savage, MICHAEL JOSEPH (1872-1940). New Zealand statesman, first Labour prime minister of the dominion. This son of a farmer at Benalla, Australia, went to New Zealand in 1907 to work as a miner. He was chosen M.P. for W. Auckland in 1919, and in 1933 succeeded Holland as Labour party chief. Winning the elections two years later, Savage took office as premier and foreign minister, and at once adopted a salary-sharing scheme for his party members. Much attention was given to social services. Savage came to London for the coronation and imperial conference in 1937, and easily won the elections next year. He led the dominion into the Second Great War, but died in office, March 26, 1940, being succeeded by Peter Fraser.

Savage, RICHARD (d. 1743). British poet. He claimed to be the illegitimate son of the countess of Macclesfield, and that his father was the 4th Earl Rivers. This claim was denied, and a poem entitled *The Bastard, 1728*, is an expression of Savage's feelings regarding the repudiation of his parentage. Further similar expressions of feeling were silenced by a pension. Savage was the author of two other poems, *The Wanderer*, which described a journey through Europe, and the *Progress of a Divine*. His poems all

have a gloomy tone, reflecting the wretchedness of his own life. The hardships of his early days were often shared with Johnson, the two sometimes being in such straits that they had not the wherewithal to pay for a night's lodging. Savage died Aug. 1, 1743, in a debtor's prison at Bristol, the gaoler, it is said, paying the expenses of the funeral. Johnson included Savage in his *Lives of the Poets*. *Consult* R. S.: a *Mystery in Biography*, S. V. Makower, new ed. 1935.

Savage Club, THE. London club. Founded in 1857 by a brilliant coterie of London Bohemians,



Savage Club badge

its 500 town and 100 country members are connected professionally with literature, art, science, and the drama, and its weekly house dinners during the winter months, to which guests are invited, have a world-wide reputation. With it are affiliated some of the leading clubs in Toronto, Brisbane, Sydney, Melbourne, and New York. The clubhouse is at 1, Carlton House Terrace, S.W.1.

Savanilla OR SABANILLA. Seaport of Colombia, S. America, in the dept. of Atlantico. It stands near the mouth of the river Magdalena, 18 m. by rly. W.N.W. of Barranquilla, of which it is the port. The harbour, though spacious, is shallow, large vessels being compelled to anchor some miles out. Most of its trade has been taken over by the neighbouring Puerto Colombia. Pop. 2,000.

Savanna. Natural grass land in tropical countries. Savannas are known, also, as llanos in Venezuela, campos in Brazil, downs in Australia, and park lands in Africa. They form one of the natural vegetation regions of the globe and occur in regions of summer rainfall between the hot deserts, which are rainless, and the tropical forests, where rain falls at all seasons. Near the desert the vegetation is patchy, near the forest trees are more numerous, elsewhere trees are usually found along the lines of the water-courses.

The rainfall varies between 10 and 40 ins. annually, and the mean temperature of the coldest



St. Savage

month is rarely below 60° F.; there are usually two seasons, the rainy and the dry, but in parts there may be two rainy and two dry seasons. Vegetation, mainly of a bulbous character, grows with great rapidity at the beginning of the wet weather, and by the end of the rainy season the seeds have ripened and fallen; during the dry season most of the vegetation withers.

Savannah. Auxiliary steamer built at Savannah, Georgia. She was the first vessel fitted with

repairing shops, foundries, machine shops, cotton-seed oil and lumber mills, and fertiliser factories. Pop. 95,996.

Planned in a sketch by a debtor who died in one of those English prisons which Georgia was founded to relieve, Savannah was first settled in 1733. It was taken by the British, Dec. 29, 1778, and made a base against the rebelling Americans. In 1789 it was incorporated. Sherman captured the city, where there has always been a large negro pop., from the Confederates in 1864.

Savery, ANNE JEAN MARIE RENÉ (1774-1833). French soldier. Born at Marcq, Ardennes, April 26, 1774, he entered the army in 1790. Having served on the Rhine, in Egypt, and in Italy, he became a brigadier-general and one of Napoleon's trusted lieutenants. The wars of 1805-07, in the course of which he was also employed as a diplomatist, added to his reputation and

brought him the dukedom of Rovigo. In 1808 he was sent to Spain, where he was largely responsible for placing Joseph Bonaparte on the throne. In 1810 he was made head of the police in France, and he was loyal to Napoleon until the last. Exiled 1815, he returned to France in 1818. In 1831 he was made commander-in-chief of the French army in Algeria and he died in Paris June 2, 1833. Consult his *Mémoires*, 1828.



General Savery,
Duc de Rovigo

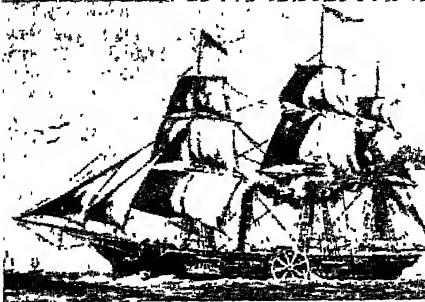
Save, OR SAVA. A river of Yugoslavia. It rises in the E. Alps, in the N.W. corner of the country, flows E. across Croatia, and between Bosnia and Slavonia, to join the Danube at Belgrade, after a course of 500 m. The chief tributaries, which all join it from the left, are the Kulpa, Unna, Vrbas, Bosna, and Drina. It is navigable to Sissek (365 m.). The chief town on its banks is Zagreb. The lower course is marshy, and the towns usually lie away from the river. Heavy fighting took place along the banks of the Save during the First Great War.

Savernake. Name of a village and forest in Wiltshire, England, lying S.E. of Marlborough. The forest, 16 m. in circumference, is beautifully wooded; its chief trees are oaks and beeches, and in it is a deer park, said to be the largest in England. In early times a royal forest, it belongs to the marquess of Ailesbury, to whom it came from the Seymours, but is leased to the forestry commissioners. In 1950 the crown commissioners purchased 10,000 acres of the Savernake estate adjacent to the forest. The village (pop. 157) has a rly. station.

Savery, THOMAS (1650-1715). English engineer and inventor. He was born at Shilstone, Devon, and became a military engineer, experimenting in his spare time. In 1696 he patented a capstan-operated paddle for driving ships. Although its practicability was demonstrated, official jealousy prevented its adoption by the Navy. In 1698 he patented an engine on the steam-vacuum principle for water-pumps in coal mines. This was installed in several mines, and provided the basis for Newcomen's steam pump. Among Savery's other inventions was a new type of assay furnace. Appointed surveyor to the waterworks at Hampton Court in 1714, he died in May, 1715.

Savigliano.

Town of Italy, in the prov. of Cuneo. Situated on the river Maira, 32 m. by rly. S. of Turin, and 8 m. E. of Saluzzo, it retains parts of its old walls, and has a fine church, containing paintings by Giovanni Molinari, a native. In the town is a triumphal arch to Victor Amadeus I



Savannah. The first vessel to cross the Atlantic using steam as an auxiliary to her sails

steam to cross the Atlantic. In 1819 she made the passage from Savannah to Liverpool in 25 days. The Savannah was fully rigged, but had an auxiliary engine upon her decks, which worked the paddles while the vessel was not under sail. The greater part of her Atlantic voyage, however, was made under sail power.

Savannah. River of the U.S.A. Rising in the Blue Ridge Mts., it flows S.E., forming the boundary between South Carolina and Georgia, and enters the Atlantic about 10 m. below Savannah city. It is about 450 m. long, and is navigable to Augusta for small steamers.

Savannah. City of Georgia, U.S.A., the co. seat of Chatham co. The second largest city and principal port of the state, it stands on the Savannah river, 18 m. from its mouth, and is served by rlys. and by ocean-going and coasting steamers. The city contains many broad, tree-shaded streets, and from the number and variety of its trees is known as the Forest City. Among the prominent buildings are the city hall, the Telfair academy, and the R.C. cathedral. Savannah is one of the foremost ports for cotton and naval stores, and also ships large quantities of lumber, cotton seed, turpentine, and resin. It has rly. car and



Savannah, Georgia. Christ Church, the old church where John Wesley preached during his residence in the Georgian city

of Savoy. There are locomotive and printing works, foundries, sugar factories, and silk, linen, and hemp manufactures. Here in 1779 the Austrians and Russians defeated the French.

Savigny, FRIEDRICH KARL VON (1779-1861). German jurist. Born at Frankfurt-on-Main, Feb. 21,



F. K. von Savigny,
German jurist
After Kruger

1779, he was educated at Marburg, and became a teacher at Landshut and in 1810 professor of Roman law at Berlin. In 1842 he was appointed to draft the legis-

lative measures of the Prussian government, with the style of high chancellor. Having reformed the divorce and other laws, he retired from public life in 1848, but lived until Oct. 25, 1861. Savigny was one of the greatest jurists of the 19th century. His *Law of Possession*, 1803; *History of Roman Law in the Middle Ages*, 1815-31; and *System of Modern Roman Law*, 1840-49, have become classics, and his principles have permeated all Continental jurisprudence. See *Jurisprudence*.

Savile, BARON. British title borne by the family of the same name since 1888. The Saviles are an old Yorkshire family and have held various titles, one of them, George, being Charles II's marquis of Halifax (*q.v.*). One branch is represented by the earl of Mexborough. In 1888 a barony was conferred on John Savile (1818-96), illegitimate son of the 8th earl of Scarbrough, whose estates he inherited. His nephew John (1854-1931), 2nd baron, assumed the additional surname of Lumley. He was succeeded as 3rd baron by his son George (b. Jan. 24, 1919).

Savile, SIR HENRY (1549-1622). English scholar. Born at Bradley, near Halifax, Nov. 30, 1549, and educated at Brasenose College, Oxford, he became known as a mathematician and a Greek scholar.

After traveling abroad he was made warden of Merton College, Oxford, in 1585, provost of Eton in 1596 by the favour of Queen Elizabeth, whose



Sir Henry Savile,
English scholar

tutor he had been, and was knighted by James I in 1604. His chief contribution to scholarship is his sumptuous edition of S. Chrysostom, 1610-13. This founder of the Savilian professorships of geometry and astronomy at Oxford died at Eton, Feb. 19, 1622.

Savile Club. London club. Founded in 1868, it is of social character, without political attachments. Its first house was in Spring Gardens, whence it soon moved to Savile Row. In 1882 the clubhouse was transferred to 107, Piccadilly. In 1929 it moved to 69, Brook St., Grosvenor Square, W.1, for its future home. Its members have included many of the greatest in the literary world, such as Stevenson, Hardy, Kipling, Bridges, Wells, and Yeats.

Saville Theatre. London playhouse, in Shaftesbury Avenue, W.1. It was opened Oct. 8, 1931, by Jack Waller, the first production being *For the Love of Mike*. One of its most noted productions was Bernard Shaw's *Geneva*, 1938. The theatre became celebrated as a home of revues and comedies in which Leslie Henson was prominent. It seats 1,250.

Savings Bank. Institution for the promotion of thrift. The term is usually applied to an organization which undertakes to receive and invest deposits of a small amount, the idea being that these represent the savings of people with small incomes. Though generally known as banks, such institutions may be so moderate in size and capital as to be in reality thrift or provident clubs. The latter are not registered as banks, and have no legal status.

The larger banks, known as trustee savings banks, can be formed only with the approval of the national debt commissioners, and are under state inspection. Their management is by boards of trustees without remuneration. These, along with penny banks, are governed by Acts of parliament, principally the Trustee Savings Bank Act, 1863, which has been frequently amended. A savings bank may also be conducted on the joint stock system, or by a municipality or by the state, as in the case of the Post Office Savings Bank (*q.v.*).

The savings bank originated at Brunswick in 1765, and others were established in France, Prussia, and Switzerland in the 18th century. The first savings bank in England was organized at Wendover by the Rev. Joseph Smith, in 1799, similar institutions being founded

in Scotland, 1807, and in Ireland, 1815. Trustee savings banks became very popular in the first half of the 19th century, the depositors increasing from 429,400 in 1831, to 1,600,000 in 1861, the year of the founding of the P.O. savings bank, in which were incorporated a large number of the trustee banks. Military and naval savings banks were instituted in 1859 and 1866 respectively. In addition there are school and railway savings banks. In 1950 there were 4½ million active accounts in trustee savings banks, and 21¼ million in the Post Office savings bank.

Savings Certificate. This form of investment for the small saver is described under National Savings.

Savoia. Name of a series of aircraft built by the Savoia-Marchetti co., Italy. Before the Second Great War this co. built a wide range of civil and military aircraft, and devoted much attention to the development of the trimotored low-wing monoplane. During the Second Great War a large part of the machines of the Italian air force were Savoia bombers and fighters. From 1946 the co. concentrated on four-engined monoplanes.

Savoie. Dept. of France. In the S.E. of the country, it is bounded on the E. and S.E. by Italy. Its area is 2,388 sq. m. The chief river is the Isère, others being its tributaries, Arc and Arly. The dept. is mainly mountainous, a number of Alpine peaks being over 12,000 ft. high. Agriculture is carried on, and sheep and cattle are reared. The vine and various fruits are grown in the valleys, and cheese is extensively manufactured. Chambéry is the chief town; other places are Aix-les-Bains, which has famous mineral springs, and Albertville. Savoie was formed into a department in 1860, being part of the territory ceded by Italy to France. It previously formed part of the duchy of Savoy (*q.v.*). Pop. 235,939.

Savona. Seaport of Italy, in the prov. of Savona. Picturesquely situated on the coast of the Riviera di Ponente, 27 m. by rly. S.W. of Genoa, it has a castle built by the Genoese in 1542. Its cathedral, 1589-1604, has a modern dome and interesting paintings. S. Maria di Castello is a 15th century church. Among other notable buildings are the Della Rovere palace, a picture gallery, and a theatre named after the poet Chiabrera, a native of the city. Additions were made to it late in the 19th century, and

Savona became one of the chief seaports of Italy, with shipbuilding yards, ironworks, and engineering workshops, foundries, etc. The manufactures include soap, paper, and silks.

The ancient Savo, the place was a Roman settlement. For some centuries there was a great rivalry between Savona and Genoa. The Genoese, in the 16th century, made its harbour useless, and then took possession of the city, which again became important after the fall of the republic. Its harbour was reconstructed in 1815. Pop. (1936) 64,199.

Savonarola, GIROLAMO (1452–98). Italian monk and reformer. Born at Ferrara, Sept. 21, 1452, he was the third son of Michele Savonarola. His grandfather, a doctor of medicine, encouraged



Girolamo Savonarola, the Italian reformer. From a painting by Fra Bartolommeo
Museum of S. Mark's, Venice

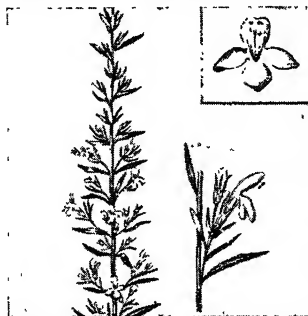
his love of learning, and as a boy he proved himself a diligent and able student. Originally intended for a medical career, he entered the Dominican Order after his hopeless love for a daughter of the noble house of Strozzi had been spurned, joining the convent of San Marco in Florence. After early failures he attracted attention in 1489 by his fervent preaching, and two years later he became prior. His theology appears always to have been orthodox; his denunciations were directed against the intellectual and sensual paganism which permeated the social and ecclesiastical organism of the time.

The enthusiasm he aroused as a moral reformer dragged him into the political vortex; assuming almost the character of an inspired

prophet warning Florence of the wrath to come, he inevitably discovered the means to her regeneration in political programmes. Charles VIII of France was to be the regenerator, and when that king actually came to Florence in 1494, Savonarola's character as a prophet seemed established. The Medici, representatives of the pagan spirit, were driven from Florence; the religious enthusiasm of Savonarola's followers, known as Piagnoni or "weepers," made it seem that he was about to establish a "kingdom of God" in Florence, in which social vices and frivolities would be as rigorously repressed as they were 150 years later by the "godly" in Great Britain.

But Florentine policy concerned other states, to whom Savonarola's political aims were not satisfactory. His claims to prophetic powers and divine authority provided Pope Alexander VI with an excuse, first for ordering him to abstain from preaching, and then, when he disobeyed, for excommunicating him. A challenge to an ordeal by fire, between one of Savonarola's followers and a friar of the antagonistic Franciscan order, ended in a fiasco which ruined Savonarola's prestige. The reaction was fatal. Savonarola was brought to trial as an impostor and a heretic, was condemned, and with two of his followers was put to death by strangling, May 23, 1498. Savonarola figures prominently in George Eliot's novel, *Romola*. *Consult* Lives, P. Villari, Eng. trans. L. Villari, 3rd imp. 1899; E. L. S. Horsburgh, 4th ed., 1911; N. Van Wyck, 1926; P. Misciatelli, Eng. trans. M. Peters-Roberts, 1930.

Savory or **SAVOURY** (*Satureia*). Genus of labiate plants, used as pot herbs. Summer savory (*S. hortensis*) is a downy, aromatic annual, native of S. Europe. It has small, narrow oblong leaves, and small, pale lilac flowers in whorls. Winter savory (*S. montana*)



Savory. Spray of foliage and flowers of *S. montana*. Inset, single flower

is a perennial with a shrubby base, native of the same region. It has slender leaves and pale purple flowers. Both plants are gathered when just coming into flower and dried for use when required.

Savoy. Cultivated variety of cabbage. It is distinguished by its curled and wrinkled leaves. It is



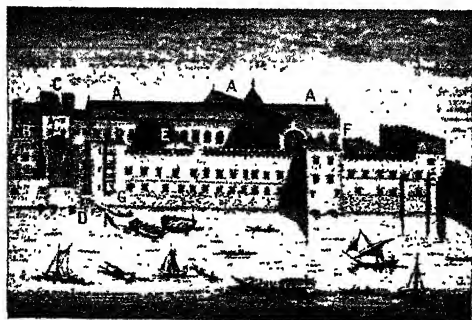
Savoy. Leaves and roots of this hardy variety of cabbage

particularly hardy and will stand frost well, and hence it is of great value during winter. By sowing seeds of early and late varieties in April and May a succession of produce is obtained in late autumn and winter. The seedlings are raised on a spare border from seeds sown in shallow drills, and are planted in their final places in June–July. Good savoys are Dwarf Green Curled, Best of All (early), Late Drumhead, Rear-guard, and New Year. Manured soil gives the best results.

Savoy. Former prov. of the kingdom of Sardinia, ceded to France in 1860. The old prov. comprised the present departments of Savoie and Haute-Savoie (*q.v.*), and was roughly contained between the Alps, the Lake of Geneva, and the river Rhône, with its capital at Chambéry. Part of the Burgundian kingdom of Arles in the 10th century, it was granted to Umberto Biancamano in 1034, and from that date until its cession to France, except during 1792–1816, was ruled by the house of Savoy (*v.i.*) as part of the duchy of Savoy and later of the kingdom of Sardinia. As the highway between France and Italy the country was of great strategical importance, but the ability and traditional valour of its sovereigns kept it intact until the armies of revolutionary France overran it on their way to Italy in 1792. The country was then formally annexed to France, but by the congress of Vienna it was restored to its ancient sovereigns. As the price of his consent to the annexation

of Tuscany to the kingdom of Sardinia, Napoleon III demanded the cession of Savoy and Nice to France. This was unwillingly conceded by Cavour and raised much protest from England and other European powers, but after an almost unanimous plebiscite in favour of annexation the formal treaty was signed March 24, 1860. *See* Cavour; Italy; Napoleon III; Sardinia, Kingdom of.

Savoy, House of. Name of the dynasty which until its expulsion in 1946 was the oldest reigning family of Europe. It was founded by Umberto Biancamano (Humbert of the White Hand) who in 1034 was granted Savoy and the adjacent territories W. of the Alps. The lands on the Italian side, later called Piedmont, were added by marriage, c. 1056.



Savoy, London. River front of the old hospital, as it appeared about 1650. AAA, main building. B, prison. CC, the chapel. D, water stairs. E, German Lutheran church. F, French church. G, German Calvinistic church.

From a print by George Vertue

Peter II (d. 1268) visited England and was made earl of Richmond by Henry III, who also gave him the manor on the Thames thereafter called the Savoy. Amadeus V, nephew of Peter and called the Great, reigned 1285-1323, extended his dominion, and acquired reputation as arbiter in various disputes between France and England. His grandson, Amadeus VI, who reigned 1343-83, took a prominent part in the stormy politics of Italy, and his son, Amadeus VII, count 1383-91, added Nice to his territories.

He was succeeded by his son Amadeus VIII (1391-1440), whom the emperor Sigismund created duke of Savoy in 1416. This wise and liberal prince abdicated in 1440 and retired to a hermitage near Geneva. Although not in orders, he was elected anti-pope as Felix V by the council of Basel (q.v.). The family underwent the varying fortunes of the unsettled times until Emanuel Philibert, who had served in the Spanish

armies under Charles V, reigned 1553-80, and raised his estate from a petty dukedom to a position of European power and importance. Succeeding dukes sided with or against France in the wars of the 16th and 17th centuries, and their territories were the scene of constant conflict until Victor Amadeus II, duke 1675-1730, and his cousin, the great warrior Eugene (q.v.), expelled the French. In 1720 Victor Amadeus became king of Sardinia. *See* Chambéry; Italy; Sardinia.

Savoy, The. District of London. S. from the Strand between Wellington Street and Carting Lane, W.C., it is named after Peter, earl of Savoy, and gives its name to a chapel royal, an hotel, and a theatre. Peter, who was granted the manor in 1236 by Henry III, bequeathed it to the monks of Montjoy, Havering-atte-Bower, Essex. From them it was bought for 300 marks (about £3,000) by Eleanor of Provence wife, of Henry III, it became a residence for many notable personages, including Alexander III of Scotland, during his visit to London, and in 1284 was

given to Eleanor's son, Edmund Crouchback. Edmund, who married Blanche, queen of Navarre, planted in the extensive gardens, famous at that time for their figs, cherries, plums, nuts, etc., the first red rose to be grown in England. He is said to have brought it with his bride from Provence.

The palace was improved and extended by Henry, 4th earl and 1st duke of Lancaster, and it served as the prison of King John of France, 1357, after Poitiers, and in 1360-64. Under John of Gaunt it witnessed many remarkable gatherings. Chaucer is said to have been married in its chapel. It was destroyed by Wat Tyler and his followers. Annexed to the crown by

Henry IV, it was rebuilt, 1512-17, under the will of that king, as a hospital or kind of monastic almshouse, the new structure being magnificent. Probably on the foundations of John of Gaunt's chapel was erected what is now known as the chapel royal. This, in 1564-1717, became the church of the parishioners of the first church of S. Mary-le-Strand, and so was known as S. Mary-le-Savoy.

In 1549 more than 8,000 people were benefited. In 1553 Henry VIII handed over the property to the hospitals of Bridewell and S. Thomas, but Mary refounded the institution in 1556, and it had among its masters George Montaigne or Mountain, who became archbishop of York; Mark Antonio de Dominis, known as archbishop of Spalatro; Sheldon, later archbishop of Canterbury; and Henry Killigrew, during whose term of office part was let out in tenements to distinguished personages, and part served as a military and naval hospital, the precinct also becoming a sanctuary for debtors. While the hospital was suppressed about 1702, the chapel remained, and under the incumbency of the notorious John Wilkinson was the scene of hundreds of clandestine marriages. Later the main building or hall became a barracks. Other parts were put to various uses, including that of a marshalsea or prison. The last of the hospital buildings disappeared when the approach to Waterloo Bridge was made in 1817. The Savoy conference was held here in 1661, and there were French and German chapels in the precinct.

The chapel is Perpendicular in style, built N. and S., and has a picturesque graveyard. It was made a chapel royal by George III, restored by George IV, 1826-30, and by Victoria, 1864. Its modern reputation is due in great measure to Henry White (d. 1900), made

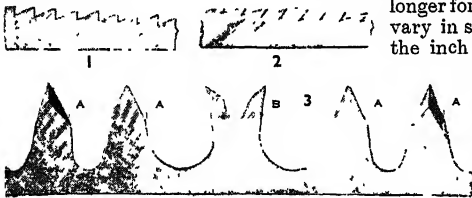


Savoy, London. Interior of the chapel royal as restored by Queen Victoria in 1864

chaplain in 1859. Thomas Fuller and Samuel Pratt preached here, and the Savoy was the burial place of Gawain Douglas, George Wither, and the Anne Killigrew of Dryden's elegiac poem. There is a memorial window to Richard D'Oyly Carte.

The Savoy Theatre receives a separate entry. Adjoining the theatre, partly on the site of the Savoy palace and that of old Worcester House, is the Savoy Hotel, opened 1889, and extended 1903-04, the Strand frontage measuring 250 ft. The ballrooms will accommodate over 1,000 guests. In the courtyard is a bronze statue of Peter of Savoy. *Consult Memorials of the Savoy, W. J. Loftie, 1878.*

Savoy Conference. Meeting of 12 bishops and 12 Puritans held in the Savoy Palace in 1661. It met for the purpose of discussing changes in the Book of Common Prayer and other ecclesiastical matters. After sitting from April 15 to July 24, the conference broke up without effecting anything, and the ultimate result was that a large number of Puritans left the established Church.



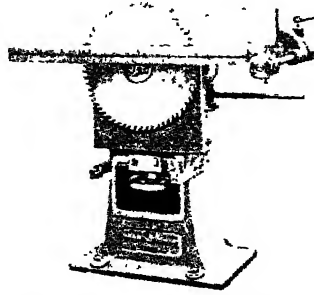
Saw. Varieties of saw teeth used for timber. 1. Rip saw teeth. 2. Cross-cut saw teeth. 3. Cross-cut double-hand log saw: A. Cutting teeth. B. Clearing teeth

Savoy Operas. A complete list of these works is given under Gilbert and Sullivan.

Savoy Theatre. London playhouse, in the Strand, W.C.2. Built for Richard D'Oyly Carte from designs by C. J. Phipps, it was opened Oct. 10, 1881, the first production being *Patience*—which had already enjoyed a long run at the Opéra Comique. The original home of the majority of operas by Gilbert and Sullivan (*q.v.*). The Savoy was the first London theatre to be lit by electricity. It was leased by H. B. Irving during 1913-19. After complete internal reconstruction, the theatre was reopened 1929. Successful productions at the Savoy have included *Merrie England*, 1902; *Peter Ibbetson*, 1920; *Young Woodley*, 1928; *Journey's End*, 1929; *The Man Who Came to Dinner*, 1941; *Life with Father*, 1947; and *Gilbert and Sullivan revivals*. The theatre seats 1,138.

Savu. Island group of Indonesia. It lies between the islands of Timor and Sandalwood. Rice, indigo, and tobacco are produced. Area, 231 sq. m.

Saw. Hand or machine tool for cutting wood, metal, stone, etc. Handsaws are the tools of the car-



Saw. Small type sawbench for joinery work

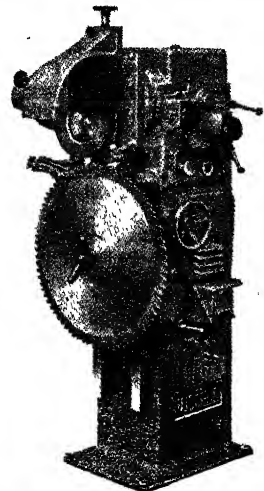
penter, joiner, and cabinet maker, for ripping (sawing lengthwise to the grain) or cross-cutting (across the grain). The blade ranges in length from 22 to 30 ins., being longer for rip saws. The teeth vary in size from about 4 to the inch for rip saws to 8 or more to the inch for cross-cut saws. In rip saws the tooth front is almost or quite vertical, whereas in cross-cut saws the front slopes back slightly from the toe of the blade.

In order to prevent the blade jamming in the saw cut, the teeth are set or bent slightly outwards from the middle line of the blade, so making the latter effectively thicker at the cutting edge than at the back. In some saws further aid to clearance is afforded by thinning the blade towards the back; blades are also tapered slightly in thickness from the heel towards the toe, behind the cutting edge. The tooth of a rip saw acts like a chisel, whereas that of a cross-cut saw slices across the fibres of the wood much as a sharp knife would do.

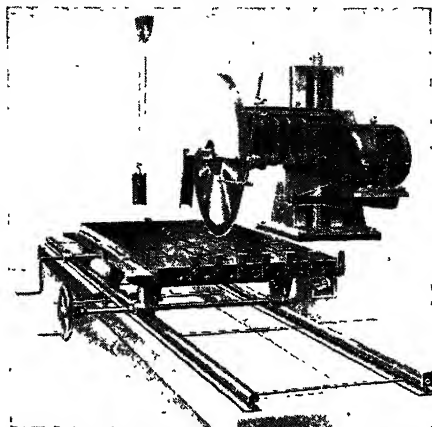
Other woodworking saws used by hand are the back saws, shorter and with a brass or steel stiffener along the top of the back which allows a thinner blade to be used and preserves the shape of the blade. Examples are tenon saws and dovetail saws, used for cutting joints. For cutting inside curves there are the compass saw

and the keyhole saw, with narrow blades. Exterior curves are shaped with the bow saw and the coping saw, which allow pierced work to be negotiated. The first has a tensioned wood frame in which the thin, narrow blade is stretched; the other has a metal bow. Back saws have small, fine teeth, with little set, enabling close work to be done in jointing.

MACHINE SAWS. Power-operated circular saws and band saws are used for converting logs into baulks and deals, for reducing large forms of timber into others suited for building work, or for cutting up timber in joinery works. The circular saw is mounted on a spindle and driven at a high speed ranging from about 3,000 r.p.m. for a saw of 12-in. diam. to 1,000 r.p.m. for one three times that diam. Rim speed, at which a point on the periphery of the blade will pass a given point, is roughly constant for all sizes, about 10,000 ft. per minute. The teeth may be formed by notching out the blade as in a hand saw, or be inserted into the blade and locked by some suitable device. The band saw consists of a narrow endless strip of steel having teeth cut in one edge. It is supported by pulleys in tension and driven by power applied to one of these pulleys. Band saws are used in sawmills for converting logs, and other types in joinery works for sawing sweeps and curved members, for which the thin, narrow blade is especially adapted. Circular saws are ordinarily built into benches, but there is another type called a pendulum saw. In this the saw itself is



Saw. Cold-metal-saw sharpener
Russell & Sons, Ltd., Leicester



Saw. A stone-cutting circular saw fitted with carbide blade.
Bramley Engineering Co., Ltd., Leeds

mounted at the lower end of a swinging frame hung on an overhead pivot so that it can be made to traverse the work.

SAWS FOR METAL. These range from the piercing saw used by jewellers and silversmiths to the large and powerful circular saw for cutting bars and billets of steel. The first has a thin, highly tempered blade like that of a fretsaw and is mounted under tension in a metal bow. Similar in principle, but employed for severing light bars and tubes, is the hacksaw, with a shallower bow. A heavier type, with deeper frame, cuts thicker bars and steel rails. Small-diameter circular saws are used for light sheet metal by silversmiths and others. Larger circular saws have solid teeth or inserted teeth. Special types for "hot-sawing"—severing bars, billets, rails, etc., as they leave the rolling mills—run at about twice the speed of timber saws. Circular saws for cutting cold steel turn at a much lower speed—about 80 ft. per minute; for cutting aluminium sheet the speed is ten times greater than this. Band saws are largely used for metal, bakelite, hard rubber, etc.

STONE-CUTTING SAWS. The older method is to employ steel blades set in a reciprocating frame, but the actual cutting agent consists of sharp grit and steel shot fed with water against the edge of the blades where they work

against the stone. More recent saws are circular in shape. In one form an outer rim of carborundum or similar abrasive material is attached to a disk of steel; in another type the steel disk is studded with diamonds which do the cutting. Such saws may be 6 ft. in diameter.

J. St. D. Reed

Sawatch, SAGUACHE, OR SIERRA MADRE. Range of mts. in Colorado, U.S.A. It parts the headstreams of the Grand and Gunnison rivers from that of the Arkansas river, and contains some of

the loftiest peaks in the country, among them being Harvard, 14,375 ft.

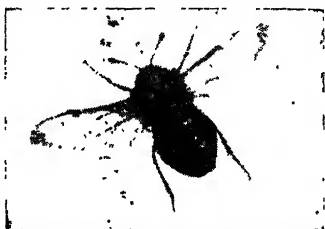
Sawbridgeworth. Urban dist. of Herts, England. It stands on the Stort, on the Essex border, 12 m. E. of Hertford, and has a station on the rly. from London to Cambridge. There are old established maltings and nurseries and a flour mill. Pop. 3,646. Pron. locally Sapsworth.

Sawdust. Fine particles produced in sawing wood or stone. Timber sawdust has many uses: it is a filling between partitions for insulating against heat or cold, and has acoustic insulating properties also. Wood sawdust can be burned in suitably designed heating or cooking stoves, and is fuel for steam boilers. Mahogany sawdust is used for fish curing; and furriers use sawdust of mahogany and rosewood in dressing furs. Mixed with cement or other binding agent, sawdust can be laid to produce a jointless flooring. It was an ancient practice to strew sawdust on floors as an absorbent. Another use is in the production of tar and alcohol by distillation. Some plastics are derived from sawdust, and methods of recombining the dust into building blocks have been used. Sawdust from the mill finds a market as a packing or stuffing material.

Saw Fish (*Pristis*). Group of large fishes. They are related to the sharks, but the upper jaw is

produced to form a long, flattened beak, having a row of sharp teeth set in sockets at either edge. They are found mainly in the tropics, but one species occurs in the Mediterranean and Atlantic. They often exceed 20 ft. in length, with a saw 6 ft. long. See Shark.

Saw-Fly. Large group of hymenopterous insects forming the greater part of the sub-order Symphyta. The name alludes to the finely toothed ovipositor with which the female saws slits in plant tissues to contain her eggs. The larvae are caterpillars closely resembling those



Saw-Fly. *Trichosoma tibialis*, a species which attacks hawthorn bushes

of moths in general appearance and many are destructive, especially the Pine saw-fly (*Diprion pini*) and the Gooseberry saw-fly (*Pteronix ribesii*), all being plant feeders. Over 400 species are British. See Forestry; Insect.

Sawtrej OR SAUTRE, WILLIAM (ex. 1401). English Lollard. While a priest at Lynn, in 1399, he was summoned before the bishop of Norwich on a charge of heresy, which he was afterwards declared to have abjured. In 1401 Sawtrej was again examined before convocation at St. Paul's by Archbishop Arundel and condemned as a relapsed heretic. He was burnt at Smithfield—the first Lollard to suffer by fire—by an order of Henry IV. See Lollards.



Saw-wort. Leaves and thistle-like flower-heads of the herb

Saw-wort (*Serratula tinctoria*). Perennial herb of the family Compositae. A native of Europe, it has



Saw Fish. Shark-like tropical fish, showing, on the left, the long saw

long leaves cut into lobes with toothed edges. The flowers form a head like that of a small thistle, of long, oval shape surmounted by a crown of red-purple rays. It yields a yellow dye.

Sawyer, ROBERT. Character in Dickens's *The Pickwick Papers*. He is one of two rowdy medical students encountered by Mr. Pickwick at Dingley Dell at Christmas, the other being Benjamin Allen. Pickwick attends an uproarious dinner party at Sawyer's lodgings in Lant Street, Borough, and hears some extravagant stories of medical experiences. Sawyer later starts in practice as "Sawyer, late Nockemorf."

Sawyer, Tom. See Tom Sawyer, Adventures of.

Saxe, MAURICE, MARSHAL (1696-1750). French soldier. Born at Goslar, Oct. 28, 1696, he was a



Marshal Saxe,
French soldier
After I. Jones

natural son of Augustus the Strong, elector of Saxony, his mother being Aurora, countess of Königs-
mark. He took the name of Saxe, and his military career began at 12, when

he joined the army of Prince Eugene in the Low Countries; he served with the Russo-Polish army against the Swedes and against the Turks in Hungary.

He added to his reputation while serving under the duke of Berwick in the French army, notably at the siege of Philippsburg in 1734. In the War of the Austrian Succession he commanded in Bohemia, taking Prague and Eger (Cheb). In 1744, now a marshal, Saxe received the command of the French army in Flanders, and on May 11 (N.S.), 1745, inflicted a signal defeat on the allies at Fontenoy. His last success was capturing Maastricht, 1747. He died at Chambord, Nov. 30, 1750. Marshal Saxe was the author of the posthumous *My Reveries*, 1757, in which he embodied his ideas on the art of war; and *Letters and Memoirs*, 1794. Notorious for amours, he is the subject of *The Prodigious Marshal*, E. B. d'Autvergne, 1930.

Saxe, DUCHIES OF. A number of former federal states of Germany, most of them in Thuringia, ruled by branches of the electoral dynasty of Saxe, which became a royal dynasty in 1866. The largest of the duchies was the grand duchy of Saxe-Weimar-Eisenach which,

at the time of its merger with the other Thuringian states after the 1918 revolution, had an area of 1,393 sq. m. and a pop. of 400,000. Next in size and pop. were the duchy of Saxe-Meiningen (953 sq. m. and 285,000) and that of Saxe-Coburg-Gotha (763 sq. m. and 270,000). The smallest was that of Saxe-Altenburg (511 sq. m. and 220,000). Apart from these four Saxon duchies, which were federal states of the pre-1918 German empire, there were a number of minor ones, e.g. the duchies of Saxe-Coburg-Saalfeld, Saxe-Gotha-Altenburg, Saxe-Hildburghausen, Saxe-Merseburg, Saxe-Naumburg-Weitz, Saxe-Weissenfels, which existed at various periods from the 12th century to 1826, but were eventually merged with the Saxon states, all being ruled by branches of the Wettin dynasty from the time when the Emperor Sigismund, in 1423, invested Margrave Frederick of Meissen of that house with the lands and the electorate.

Internationally, the Coburg branch played the most important part; it produced Portugal's king Ferdinand II, Belgium's royal dynasty founded by Leopold I, Bulgaria's prince, later King Ferdinand, and Queen Victoria's prince consort Albert. Coburg itself was ruled, during 1893-1900, by Victoria and Albert's second son Alfred, duke of Edinburgh, and from 1900 to 1918 by Leopold Charles, duke of Albany, son of their fourth son. Queen Victoria's mother was also a princess of Saxe-Coburg.

Both the Weimar and the Meiningen rulers won a reputation as patrons of arts and letters. Under Charles Augustus (1758-1828) Weimar, and Jena university, became an intellectual centre of Europe, where Goethe, Schiller, Herder, Wieland, and others of European eminence lived and wrote. Meiningen, under duke George II, who acted as stage-manager of his own theatre from 1874, gained international fame as a school of acting; this tradition was kept up by duke Bernhard who, after his abdication, took up the theatre as a profession.

Together, the four duchies represent 80 p.c. of the total area, 77 p.c. of the pop., of the free state of Thuringia, formed in 1919. The town and former district of Coburg then, however, voted for inclusion in Bavaria. Situated between the rivers Elster and Werra, and crossed by the Saale and Unstrut, some 50 p.c. of the mostly hilly

country is developed agriculturally; about one-third is forest. Its economic basis, however, is small scale industry: tools, toys, china, glass and stoneware, leather, food (especially sausages and chocolate), weaving, and specialised branches of engineering. Market gardening and seed production also flourish. There are many spas and health resorts in the Thüringer Wald, a range of hills and mts. up to 3,000 ft. which covers the S. half of the duchies; until, after the Second Great War, it was handed over, by the British and U.S. forces who had conquered it, to Russian occupation, the international tourist industry played an important part in the economic balance of the country.

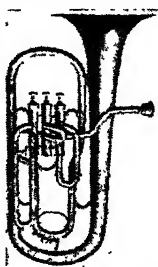
There are only three towns with a population exceeding 50,000: Gera, Jena, and Weimar. The smaller towns, with palaces, theatres, orchestras, museums, schools, and other attractions provided at an early date by ambitious rulers rivalling one another had a fascination for visitors from abroad. Owing to their close family relations with the rulers of the great powers, e.g. the Weimar dynasty with the Prussian and Russian courts, the Coburgs with several European royal houses, the duchies enjoyed a political importance by far exceeding that due to their size, numbers, or material wealth. The Nazi party, even before assuming power, tried to implicate dethroned members of those dynasties, such as the last duke of Saxe-Coburg, and ex-king Ferdinand of Bulgaria, in its political activities. See Thuringia.

Edgar Stern-Eubarth, Ph.D.

Saxe-Coburg-Gotha, DUKE OF. Title held by members of the family of Wettin. Ernest I (d. 1844) was the first duke of this united duchy, and his son Ernest II (d. 1893) the second. Ernest's brother was Albert, prince consort, and when Ernest died childless the succession passed to the sons of Albert and Queen Victoria. The prince of Wales, afterwards Edward VII, having renounced the succession, it passed to his brother, the duke of Edinburgh (q.v.). On that prince's death in 1900, the duke of Connaught having renounced, the duchy passed to Leopold Charles, duke of Albany (q.v.), who was the last holder, abdicating in 1918.

Saxhorn. Brass musical instrument invented by the Belgian, Adolphe Sax (1814-94). For orchestral use, the saxhorn is sometimes pitched a tone higher than the

usual keys. With the exception of the tuba, which is the only member of the family which has found much acceptance in the orchestra, owing to the lack of blending with other instruments, the mechanism is based on that of the cornet, having three pistons which respectively lower the pitch one, two, or three semitones. In the tuba another valve is needed, which lowers the pitch a perfect fourth. The saxhorns are useful members of the military band.



E flat tenor saxhorn
Hawkes & Son

Saxicola (Lat. *saxum*, stone; *colere*, to inhabit). Genus of birds of the family Turridae. Natives of Europe, S. Asia, and Africa, two species, the stonechat (*S. torquata*) and whinchat (*S. rubetra*), are visitors to Britain. These birds are insectivorous, catching their prey on the wing, and are characterised by strong beaks and long, pointed wings.

Saxifragaceae (Lat. *saxum*, stone; *frangere*, to break). Family of herbs, including a few trees or shrubs, occurring mostly in the temperate and cold regions. They are of very variable habit, and are of little importance economically, though the genus *Ribes* includes the gooseberry and currants. From the gardener's point of view the family, which contains 90 genera and about 750 species, is important as containing such genera as *Hydrangea*, *Astilbe*, *Escallonia*, *Fraxinea*, *Cunonia*, *Heuchera*, and *Chrysosplenium*.

Saxifrage OR **SAXIFRAGA**. Genus of mostly perennial herbs of the family Saxifragaceae (v.s.). There are about 200 species, distributed throughout most of the regions of the world, except Australasia and S. Africa, and most frequent in the mountainous regions of the northern hemisphere. Many of the saxifrages bear their leaves in low-growing rosettes. The five-petalled flowers, usually white or yellow, but occasionally red or purple, grow in cymes. Twelve species are natives of Britain, including London pride (*S. umbrosa*) and meadow rockfoil (*S. granulata*), common in meadows and on sandy banks. Of the numerous alpine varieties many are now cultivated in Britain, their easy growth and compact foliage mak-

ing them favourite plants for a rock garden. Mother of thousands (*S. sarmentosa*) is a graceful basket plant. See London Pride; Mother of Thousands; Rock Plants.

Saxmundham. Market town and urban dist. of Suffolk, England. It is 20 m. from Ipswich, and is a rly. junction. The chief build-



Saxhorn. Compass and sounding values of seven instruments of the saxhorn type

ing is the church of S. John the Baptist, and the chief industry is a trade in corn and cattle. Market day, Wed. Pop. est. 1,300.

Saxo Grammaticus (fl. 12th century). Danish historian. Born probably in Zealand, he became secretary to Bishop Axel or Absalon, of Roskilde, later archbishop of Lund, and at his instigation wrote his *Historia Danica*. The first nine parts give a wonderful picture of ancient Denmark, drawn from sagas and legends, but are scarcely historical. The last seven parts, devoted to the author's own times, are among the most brilliant and graphic historical accounts ever written. The work, first published by Lave Urne, bishop of Roskilde, in 1514, was probably completed about 1208-23. The first nine books were translated into English by Oliver Elton in 1894, with introduction and notes by F. York Powell.

Saxonite OR **HARZBURGITE**. In geology, a variety of peridotite. They contain olivine, picotite, chromite, hornblende, etc., and are often porphyritic in texture. Typical rocks of this class are found in Cornwall, Ayrshire, Baste near Harzburg, N. America, etc.

Saxonite. Permitted gelatine blasting explosive which can be fired in a 9 p.c. methane-air mixture without causing the inflammable methane (fire damp) to ignite. This property is conferred

by incorporating into the mixture of 24 to 26 p.c. nitroglycerine and 32.5 to 34.5 p.c. ammonium nitrate about 25 p.c. of inert sodium chloride, which serves to reduce the temp. of the explosion. This is a strong explosive and is used with hard coal and rock.

Saxons. Teutonic people, whose territory has greatly varied in historic times. Their name probably signifies swordsmen. Ptolemy (c. A.D. 150) states that they inhabited Slesvig and three islands off its W. coast. In 286 they appear as pirates in the North Sea and English Channel, and by about 350 they had crossed the Elbe and extended their sway almost to the Rhine. In the 5th century they had made settlements at Bayeux and the mouth of the Loire, and according to Bede were associated with the Angles and Jutes in the conquest of Britain. The names Essex, Middlesex, Sussex, and Wessex, which contain their name, support the theory that their settlements were confined to S. England, but it is very doubtful whether any distinction can be made between the Saxon and Anglian settlers, as they all called themselves Angles, and were all called Saxons by foreigners.

In language, customs, and social organization the Saxons of England belonged to the Anglo-Frisian group, intermediate between Scandinavians and Germans, and differed markedly from the Saxons of Germany, or Old Saxons. This is probably explained by the fact that after the migration of part of the nation to England, and of part to the modern Hanover, Westphalia, and Prussian Saxony, the latter section amalgamated with the Chauci, Angrivarii, Cherusci, and other German tribes, and thus became Germanised. The Saxon federation extended from the Eider to the Harz, and from the Elbe to the Rhine delta. Its religious centre was the Irmsul at Eresburg, perhaps Marsberg. The Saxons stubbornly maintained their independence and religion, waged frequent wars with their neighbours, the Franks, and under their able leader Witikind were the most formidable enemies of Charlemagne, who conquered them only after 32 years' fighting (772-804). They were forced to adopt Christianity, and to become subjects of the empire, in which their territory afterwards formed a duchy.

Saxony. Former state of the German republic, until 1918 a kingdom, now a *Land* of E. Germany. The German name is

Sachsen, while the French form is Saxe. The area of the former state was 5,856 sq. m., and on its borders



Saxony. Arms of the former kingdom

were Prussia, Bavaria, and Czecho-Slovakia. Much of the district is hilly, the chief range being the Erzgebirge in the west. The great river is the Elbe; others are the Mulde, two

Elsters, and Spree. Dresden was the capital, but Leipzig is the largest town. The population numbers 9,800,000 (1950 est.).

Saxony was one of the great industrial areas of Germany. Agriculture flourished; rye, oats, wheat, barley, and potatoes were largely grown. In addition to Leipzig and Dresden, with their multifarious industries, other manufacturing towns were Chemnitz, Plauen, Zwickau. The mining industry flourished, coal, silver, copper, lead, and nickel being raised. Freiberg was the chief mining centre.

Early History

The Saxony of the Middle Ages originated in the 8th century in the land inhabited by the Saxons, one bounded roughly by the Rhine, Elbe, and Eider. The Saxons were conquered by Charlemagne, and after his empire was dissolved, about 850, a duke of Saxony appeared. Soon the dukedom became hereditary and a certain Otto held it. Otto's son was Henry the Fowler, who, in 919, was chosen German king, a dignity held by his son Otto the Great. Otto the Great deputed some of his duties as ruler of Saxony to another, and a new line of dukes was established.

About 1100 Lothair, who later became German king, was appointed duke, and the marriage of his daughter to Henry, duke of Bavaria, brought the duchy into the possession of the family of Welf. Henry's son was Henry the Lion. In 1180 he was crushed and the great Saxon duchy, the area of which had been extended by him, was broken up. The name Saxony was lost by the district now known as Westphalia and by other parts of medieval Saxony, but was retained by two small areas, Lauenburg and Wittenberg.

The two parts of the duchy were soon separated. After many changes Saxe-Lauenburg became, in 1728, part of Hanover, while from Saxe-Wittenberg developed

the modern republic. In 1356 its ruler was declared one of the seven electors, and in 1422 the last male of its ruling house died. The emperor bestowed the duchy upon Frederick, margrave of Meissen.

Under Frederick Saxony became one of the most important of the German states, but like so many of them it was weakened by partitions. The most decisive of these was made in 1485, by which the Saxon lands were divided between two brothers, Ernest and Albert, the two lines known to historians as the Ernestine and the Albertine being thereby established. Ernest, the elder of the two, received Wittenberg and Thuringia, while Albert secured Meissen. Ernest, who obtained the title of elector, was followed by his son Frederick. In his time came the Reformation, and this originated in Saxony. Luther was a Saxon and in Saxony was Wittenberg.

The war which these religious changes generated produced a curious result in Saxony. The elector, John Frederick, was one of the princes who, as members of the league of Schmalkalden, took up arms against Charles V. On the emperor's side, however, was Maurice, the ruler of the lands given in 1485 to the Albertine branch of his family. Maurice, although a Protestant, materially assisted Charles to crush his foes at Mühlberg in 1547, and his reward was the dignity of elector and a good part of Saxony, John Frederick being deprived of both. The Albertine princes, therefore, became electors, and later kings of Saxony, while the Ernestine princes were perforce content with the lands which later were divided among them as Saxe-Weimar, Saxe-Coburg-Gotha, etc.

17th and 18th cent. Saxony

In the Thirty Years War Saxony was at first neutral, but in 1629 assisted the Swedes. Victories were won, but the land was plundered first by the imperialists and then by the Swedes. The devastations of the latter were due to the peace of Prague, by which the elector deserted them and withdrew from the war. It has been estimated that by 1648 the population of the country had been reduced by half.

Saxony's rulers took their part in the decaying organization of the Holy Roman Empire and sent their soldiers to fight its battles. They also separated areas of the electorate to form principalities for younger sons, but after a time these junior lines became extinct and

once more electoral Saxony was whole.

Its ruler fought on the side of Austria during the Seven Years War, and the result was again loss and suffering, with nothing to place on the credit side. When France made war upon the Empire, the elector of Saxony entered the struggle as a German prince, but in 1796 he withdrew, making peace with the republic. In 1806 he joined Prussia in rising against Napoleon, and his men were in the force overwhelmed at Jena; after that, turning again to France, he received the title of king and became a member of the confederation of the Rhine.

Modern Saxony

Henceforward Saxony remained, on the whole, true to Napoleon, and Saxons fought for him at Leipzig. For this the allies made king and people pay. Russia and then Prussia was in possession of the country, and its fate was hotly debated at the congress of Vienna. At length about half the kingdom (7,800 sq. m.) was given to Prussia. In the 19th century the Saxons secured religious and civil liberties. In 1831 a new constitution, with an elected legislature and a responsible executive, was granted. In 1866 the Saxons threw in their lot with Austria. The land was overrun by the Prussians, and at the peace they were forced to pay a large sum of money. As a member of the N. German Confederation, Saxony's army came under Prussian control, and Saxony joined the German empire founded in 1871.

On Nov. 8, 1918, at the end of the First Great War, the king abdicated and the country was declared a republic. This became one of the federal states of Germany under the Weimar constitution; but Hitler's Unification Act of 1933 and his reformation of the Reich, 1934, deprived Saxony of all sovereign rights. After the Second Great War the whole area lay in the Russian zone of occupation, and in 1946 was made a *Land*, enlarged by parts of Silesia not Polish-occupied, W. of Görlitz and N. of Saxony's former border. See Germany; Luther; Reformation.

Saxony-Anhalt. *Land* of E. Germany, comprising mostly the former Prussian prov. of Saxony (v.s.). The capital is Halle-am-Saale. Area 9,400 sq. m. Pop. 4,250,000. See Anhalt.

Saxophone. Brass musical instrument. It was invented by Adolphe Sax, and has a mouthpiece similar to that of the clarinet and fitted with a single



Saxophone in alto size
Hawkes & Son

tra, the second for the military band. The compass is about the same as that of the oboe. The saxophone has tended to become confined to dance bands, though Glazounov wrote a concerto for it.

Say, JEAN BAPTISTE (1767-1832). French economist. Born at Lyons, Jan. 5, 1767, he passed some years in business in London. Having returned to France, he entered upon a literary career, and during 1799-1804 took part in political life. His later interests included the establishment of a cotton factory, but his main occupation was in economics, and, after having been professor at a conservatoire, he was, in 1831, chosen professor of political economy at the Collège de France. A follower of Adam Smith, whose views he made known in France, Say's great work is his *Treatise on Political Economy*, Eng. trans. 1821, which he expanded in an edition of 1828-30. He also wrote a book on England and the English, 1815. Say died Nov. 15, 1832.

Say, JEAN BAPTISTE LÉON (1826-96). French politician. A grandson of J. B. Say (*v.s.*), he was born in Paris, June 6, 1826, and adopted first a business career. He entered the chamber of deputies in 1871. During 1871-72 he was prefect of the Seine, and in 1872-73, 1875-79, and 1882 was minister of finance, being responsible for paying the indemnity to Germany. In 1890-91 Say was president of the senate. He died in Paris, April 21, 1896. Say, like his grandfather, a free-trader and in politics a Liberal, did a great deal to restore the prosperity of France after the war of 1870-71 with Prussia.

Sayansk Mountains. Extension of the Altai Mts., Central Asia, on the borders of Mongolia and Siberia. The range trends E.,

separating China from Irkutsk. It attains an average alt. of 6,000 ft., rising in Mt. Mungo-Sardyk to over 11,400 ft.

Sayce, ARCHIBALD HENRY (1846-1933). British philologist and Orientalist. He was born Sept. 25, 1846, and educated at Shirehampton, Glos, Bath, and Queen's College, Oxford, becoming a fellow in 1869. He was professor of Assyriology in the university, 1891-1919. Although making a special study of the ancient empires of the East, he did much to popularise the general results of comparative philology. His most important works were *Introduction to the Science of Language*, 1879; *Principles of Comparative Philology*; *Assyrian Grammar*; *The Archaeology of the Cuneiform Inscriptions*, 1907; *The Religions of Ancient Egypt and Babylonia*, 1913. In 1874-84 he was a member of the commission for the revision of the Old Testament. His reminiscences appeared in 1923. Sayce died Feb. 4, 1933.

Saye and Sele, BARON. English title borne by the family of Twisleton-Wykeham-Fiennes. Lord Saye and Sele is said to have been the title granted in 1447 to Sir James Fiennes, lord treasurer of England, who was killed by Jack Cade's rebels in 1450. His son William, 2nd lord, vice-admiral of England, was slain at Barnet in 1471. The title, which had hitherto been assumed on the summons of the holder to parliament, was confirmed and made hereditary by letters patent in Richard, 7th *de jure* lord and 1st baron, 1603. His son William was created a viscount in 1624. James, 2nd viscount, died without leaving a son, and the viscounty passed to his nephew William, and expired on the death of the 6th viscount in 1781. The barony had passed into abeyance on the death of the 2nd viscount, but this was terminated in the person of Thomas Twisleton, descendant of the 2nd viscount's daughter Elizabeth, who became 13th baron.

Sayers, DOROTHY LEIGH (b. 1893). British author. She was



Dorothy L. Sayers,
British writer

educated at Somerville College, Oxford, and first went into print with poetry called *Op. 1*, 1916. Detective fiction brought her fame, through the methods and conversation of

her Lord Peter Wimsey, hero of such tales as *The Unpleasantness at the Bellona Club*, 1928; *Five Red Herrings*, 1931; *The Nine Tailors*, 1934; *Gaudy Night*, 1935; and of a play, *Busman's Honeymoon*. Dorothy Sayers, who in 1926 married Atherton Fleming, wrote a more serious play, *The Zeal of Thy House*, 1937; and was praised in 1942 for *The Man Born to be King*, a cycle of twelve radio plays presenting the Gospel story in modern speech. *The Mind of the Maker*, 1941, was an essay on the idea of God as a creative artist. In 1946 appeared *Unpopular Opinions*; in 1947 *Creed or Chaos?*

Sayers, Tom (1826-65). English pugilist. Born at Brighton, May 25, 1826, he first became



Tom Sayers,
British pugilist

famous in the prize ring in 1849, and secured the championship in 1857. His only defeat was by Nat Langham, Oct., 1853. Sayers fought his famous battle with J. C. Heenan (*q.v.*), the American champion, at Farnborough, April 17, 1860, the fight ending in a draw after 37 rounds. This was Sayers's last appearance in the ring. He died Nov. 8, 1865, and was buried at Highgate. *See* Boxing.

Scab. Parasitic disease of sheep (*q.v.*). The word is also used for the hard raised surface which forms, by the clotting of blood and lymph, after an injury to the skin.

Scabbard (Old Fr. *escale*, shell; Ger. *bergen*, to hide or protect). Term applied to the sheath or case in which a sword or dagger is carried. Serving the double purpose of protecting the edges and point of the weapon and of making it portable, the sword scabbard is usually of metal, sometimes covered with leather, and is fitted with rings near the hilt end for attaching to the sword-belt. The sword fits sufficiently tightly to require slight force for its withdrawal. When swords were in more general use the scabbard was frequently ornamented with carving or chased work. *See* Celt colour plate; Sword.



Scabbard
of sword

Scabies. An itching skin condition caused by a spider-like eight-legged parasite *Acarus* or *Sarcoptes scabiei*, just visible to the naked eye. The female parasite burrows deep in the skin layers to deposit her eggs, some 30 in number; these mature in about 10 days. Scabies is a common skin condition, and is easily passed from one person to another by contact. The physician, not surprised to find it in children, often fails to diagnose it in the adult.

The burrows are scratched by the patient, as the irritation is extreme, and is made worse by heat at night. Thus secondary infection is caused. The commonest site of the disease is between the fingers, or in the folds of the wrist, though almost all parts of the body may be affected. The parasite can be recognized under the microscope. The treatment is a hot bath, followed by the application of benzyl benzoate all over the skin surface. Clothing and linen should be boiled.

Scabies is a notifiable disease in the U.K. A medical officer can insist on inspecting premises where an infected person has resided, and on examining suspects, if necessary treating any infected.

Scabious OR PINCUSHION FLOWER (*Scabiosa*). Genus of annual and perennial herbs of the family Dipsacaceae. Natives of Europe, W. Asia, and Africa, they



Scabious. Flower head of *S. arvensis*; top, right, of *S. succisa*



have opposite leaves, entire or deeply cut into lobes. They have small tubular flowers packed

into a head, and an outer series with flat rays. These are varied in colour, according to species, from blue, purple, and crimson to white. The Small Scabious (*S. columbaria*), the Devil's-bit Scabious (*S. succisa*), and the Field Scabious (*S. arvensis*) are well known British wild flowers; and the Mournful Widow (*S. atropurpurea*), wild in S.W. Europe, is a favourite English garden annual.

Scaevola, GAIVS MUCIVS. In Roman legend, a young Roman noble who, when the Etruscan

army under Lars Porsena was besieging Rome, made his way into the Etruscan camp with the intention of murdering Porsena (q.v.). Not knowing him by sight, he killed his secretary in error. Seized and threatened with torture by the king, the young Roman, to show his fortitude, allowed his right hand to be burned by a fire until it was useless. The king was so impressed by this heroic act, and also by the young man's statement that 300 other noble Roman youths had sworn to murder him, that he raised the siege and made peace. Gaius Mucius was ever afterwards known as Scaevola (left-handed); the appellation descended to his family.

Scaevola, QUINTUS MUCIVS. Distinguished Roman killed in the proscription of Marius, 82 B.C. According to Cicero he was the most learned lawyer of his time, being the first to establish a system of civil law.

Sca Fell. Mountain group of Cumberland, England. It is 11 m. from Keswick, at the E. end of Wastwater. It consists of two main peaks, Sca Fell Pike (3,210 ft.), the highest mountain in England, and another (3,102 ft.). The two are separated by a narrow ridge called Mickledore. The ascent is best made from Wasdale Head via Lingmell. During the First Great War, German prisoners improved the road leading to the

mountain. In 1919 Lord Leconfield presented the summit of the pike to the National Trust as a war memorial. See Lake District.

Scaffold. In general, a platform structure of temporary character designed for the use of men building or repairing a house. The term also applies to the raised platform on which a criminal is executed, either a simple structure on which the block or guillotine is placed, or the special contrivance with drop apparatus used in execution by hanging.

Scaffolding. Temporary framed structure with plank platforms from which building operations are carried out. The materials used are timber poles connected together with rope or wire lashings, and galvanised steel tubes con-

nected with couplings and other fittings. Steel is now more widely used than timber, especially for large buildings.

There are two main types: the bricklayers' or single scaffold, which is partly supported on the walls, and the masons' or double scaffold which has two lines of standards and is independent of the walls. The bricklayers' timber scaffold is made of poles placed horizontally, vertically, and obliquely, and lashed or fastened together for the support of platforms on which builders work, and to which materials and appliances are hoisted. The vertical members (standards) and the horizontals (ledgers and putlogs, the latter square or rectangular in section), form the principal framework; the diagonals (braces) strengthen it.

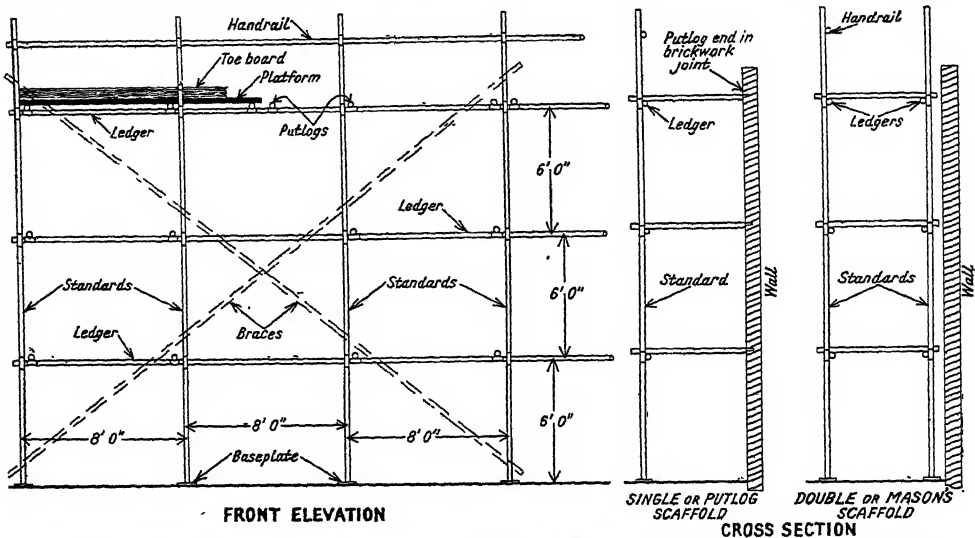
In bricklayers' scaffolds, the putlogs (short timbers of rectangular section placed at right angles to the ledgers to support the platform) rest at one end on the brickwork in course of construction; but scaffolding for masonry, to



Sca Fell, Cumberland. Sca Fell Pike, the highest mountain in England, 3,210 ft. above sea level

avoid disfiguring the stonework, must be independent of the wall, and have a double framework of uprights and ledgers. In constructing a bricklayers' scaffold, the first step is to erect the standards (singly or in pairs) in a line with each other and parallel to the walls, the poles being set at distances of 6 ft. to 8 ft., and standing 4 ft. to 6 ft. in front of the building. These uprights are sunk 2 ft. or more into the ground, or planted in barrels.

Next, the ledgers are lashed to the standards at a height of 5 or 6 ft. from the ground, and tied to each other where they meet. Then the putlogs can be placed, about 5 ft. apart, one end resting on the ledger, the other end on the wall, where they are given a "bearing" of about 6 ins. A putlog touching



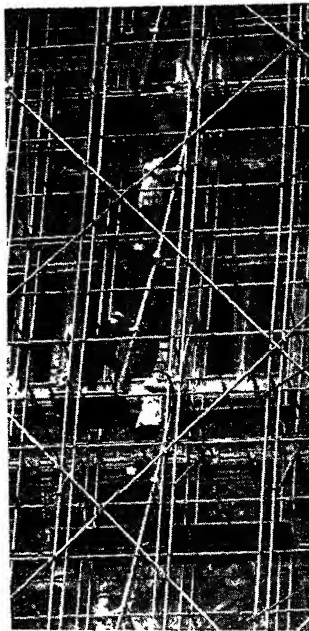
Scaffolding. Diagram illustrating the lay-out of steel tubular scaffolding which has largely superseded wood spar erections. Below, dismantling a steel scaffolding from the Victoria Tower, Houses of Parliament, Westminster

a standard may serve as foothold for the next "rising standard." Across the putlogs, and longitudinally to the wall, the platform planks are laid, three to five abreast to form a platform three or four ft. wide, each end of each board being firmly supported by a putlog to prevent tilting under weight, no board projecting more than 6 ins. over a putlog.

Boards set on edge may form a rim to the ledger edge of the platform, and a guard-rail is fixed some 3 ft. 6 ins. above platform level. Poles are of pine, spruce, or larch, 30 to 50 ft. long, and 6 to 9 ins. in their largest diameter; putlogs, often birch, are usually in 6-ft. lengths. Platform boards are 12 to 14 ft. long, the ends being commonly bound with strap-iron to prevent splitting.

Three-strand Manila cords are best for lashing, and are tied in many different ways to meet various conditions, the clove hitch being used for tying ledgers to standards. Wire ropes are often used, and patent systems, with chains, clamps, screw-bolts, etc., are substituted often for lashings.

Steel tubular scaffolding is of two types, corresponding to the timber scaffolds already described. The members are connected together with steel couplings which are quickly secured by nuts and bolts. Advantages over timber are quicker erection and striking, longer life, consistent strength so that large scaffolds can be designed scientifically, and greater ease of handling and transport.



The tubular standards are fitted with base plates which stand direct on firm paving or can be nailed to timber soles. The standards are in 9 ft. lengths and can be built up by using pin couplers. Double couplers are used to connect standards to ledgers at right angles, and swivel couplers to connect diagonal braces to standards and ledgers. Steel putlogs are fitted with flat heads at one end and these can be inserted in

brickwork joints. Tubular struts and shores are made for strutting floors and ceilings, and these, too, are adjustable for length.

Special types of scaffolding are : (a) Cantilever scaffolds which are not built on the ground or floor but project from the upper part of the building, leaving the ground space unobstructed; the scaffolding is supported partly on sills and cornices and partly by passing ledgers through window openings and anchoring them back inside the building. (b) Suspended scaffolding, consisting of cradles fitted with handrails and hanging by wire ropes from projecting members fixed to the roof or passed through window openings, used for painting and repairs; these cradles can be raised or lowered with winches worked from inside the cradles.

A scaffold gantry is a strong staging built over the footpath and supporting the scaffolding above, while the public can continue to use the footpath. Another type of gantry is a staging used to support a crane.

Bracket scaffolds are sometimes used for light repair work. They consist of two or more steel brackets fixed to grapples driven into wall joints. Scaffold planks are then laid across the brackets.

Ladders, simple or extensible, are, in Western practice, the chief means of access to scaffolds, but, in India and elsewhere in the East, the workers go up and down a fenced incline, and the scaffolding is commonly of bamboo. In some

parts of Europe scaffolding is erected on the inside of the building, and in Britain stone buildings are often served from inner gangways supported on light scaffoldings. A detail of scaffolding, known as a "cripple," comprises a platform, consisting of a single board jutting out at right angles from a ladder, and supported in this position either by a bracket of wood or by an adjustable quadrant of metal. Ladders are occasionally combined as the chief members of light scaffolding, and this use has been systematised in several patented arrangements. Tower extension ladders, running on wheels, are in effect portable scaffolds, although they are less used in building operations than for gaining access to high-placed street lamp standards, overhead tramway wires, etc. See Building; Iron and Steel Construction. *Consult* Building Regulations under the Factory and Workshop Act (H.M.S.O.), 1946; Building Construction, G. A. and A. M. Mitchell, new ed., 1948.

Scagliola (Ital. *scaglia*, horn). Artificial decorative marble much used by early Florentine builders. Its manufacture is said to have been revived by Guido Sassi in the 16th century, and it was introduced into England about 1750 by James Wyatt. Apparently its basic constituent is plaster of Paris (*q.v.*), colour being added and the face hardened by old Italian processes that the makers prefer not to reveal. Its appearance is only slightly inferior to that of natural marble, and it is manufactured and extensively used in England. *Pron.* skal-yola.

Scala, LA. Opera house in Milan, Italy. Dating from 1778, and built on the site of the church

world. In connexion with it are a ballet school and a singing school. The theatre has been civic property since 1872. The building was restored in 1878 and again in 1922, when Arturo Toscanini became its director. Many famous Italian operas received their first performances here. During the Second Great War the Scala was gutted as a result of Allied bombing from the air in Aug., 1943. It was reopened in 1946, when regular opera seasons restarted.

Scalanova, GULF OF. Opening off the W. coast of Asiatic Turkey. From E. to W. 45 m. long, and of an average width of 20 m., it partially contains the island of Samos. It is overlooked on the S. by the Samsun Dag (Mycale).

Scalar. In mathematics, a term introduced by Sir W. Hamilton in the nomenclature of quaternions (*q.v.*). Quantities which, like forces, depend for their effect on direction as well as magnitude, are called vector quantities; those having only magnitude, such as area, are called scalar quantities.

Scala Theatre. London theatre, in Charlotte Street, Tottenham Court Road. It stands on a site where there has been a theatre since 1760. The old house was called the West London, then in turn the Regency, the Queen's, the Fitzroy, and the Prince of Wales's. The building, opened Sept. 23, 1905, under the management of Forbes-Robertson, was named after La Scala in Milan. Architecturally it is a magnificent building, but it failed to attract patrons, was for some years unused, and then became a cinema. Later it became a centre for amateur productions. Donald Wolfitt gave a Shakespearian season here in 1944 and there was a ballet season in 1948. The theatre seats 1,070.

Scald (late Lat. *excaldare*, to dip in hot water). Injury to the skin, mucous membrane, or deeper tissues, produced by boiling water, superheated steam, or other extremely hot fluids or gases. See First Aid.

Scale (Lat., *scala*, ladder). Term applied to various classes of

things that ascend, as it were, by steps, *e.g.* musical notes, fees. The word also denotes a line or an area on which marks indicate suc-

cessive units of length or area, *e.g.* a scale of inches.

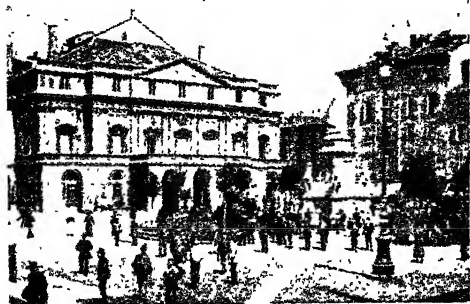
A scale of fees for the services of professional men, such as solicitors or auctioneers, is usually determined either by an outside body, such as the supreme court, or by the body controlling the profession. Generally fees prescribed are the maximum that may be charged.

Scales of length, made of wood, metal, or plastic, are in general use for the preparation of drawings. They may be (a) scales of standard lengths, appropriately divided, *e.g.* of inches divided into tenths, eighths, etc., or metric scales showing centimetres, millimetres, etc.; (b) logarithmic scales, graduated according to the logarithms of the numbers indicated, such scales being an essential feature of the slide-rule (*q.v.*); (c) proportionate scales, used for the construction of reduced or enlarged drawings. On such scales the graduations bear a constant relation to the inch. They give immediately and directly the length required in a particular drawing to represent a stated length.

The scale of a map is the ratio between a distance on the map and the true distance, *e.g.* one in. to one m. (or "one-in." map, useful for pedestrians), six ins. to one m. (for town planning and other detailed work), 4 m. to one in. (motorists' map), 1 to 1,000,000 or 1 to 10,000,000 (for maps of countries). A scale can be shown as a representative fraction; *e.g.*, 1/5280, instead of one ft. to one m.

A scale of notation is a basis for giving to figures a positional value. Ordinarily we use a scale of 10, or a decimal notation; thus, reading from right to left, the successive figures of the number 11111 indicate unity 10^1 , 10^2 , 10^3 , 10^4 . In a scale of 7 the number 11111 would indicate $1 + 7 + 7^2 + 7^3 + 7^4$, i.e. 2801 in the decimal notation. See Duodecimal.

Scale. (1) A musical scale consists of the sounds which subdivide the interval of the octave, arranged in progressive order. It has varied, and still varies, in different nationalities and at different times. In the European system the sequence of the steps depends upon the mode, according as the 3rd and the 6th degrees form major or minor intervals with the tonic. The major or diatonic scale is composed of two disjunct tetrachords, each consisting of two tones and a semitone; the complete order is therefore tone tone, semitone, tone, tone, tone, semi-



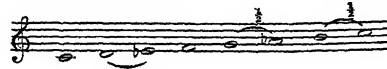
La Scala, Milan. Main entrance to the opera house

of Santa Maria della Scala, it seats 3,600, measures 330 ft. by 122 ft., and is considered to have the best acoustics of any opera house in the

tone. From these tetrachords is developed the whole system of 15 keys.



The minor scale (harmonic form) has the 3rd and 6th degrees lowered a semitone.



In order to avoid the augmented second which thus results between the 6th and 7th degrees, both of these are subjected to the following modifications:

Ascending



Descending



These form the melodic minor scale. The chromatic scale proceeds wholly by semitones, of which there are 12 in the octave. In the early 20th century the whole tone scale was much exploited by Debussy, Schönberg, and other composers. As implied by the name, the semitone is eliminated. This scale is, of course, hexatonic.

Of other scales, the pentatonic—or more accurately the pentaphonic—is used in Gaelic, Chinese, and Japanese music in various forms, while in India the octave is divided into 22 portions, called s'rutis. In practice, however, the scales, like those in use in Great Britain, are heptatonic, either by filling up gaps with ornamental notes or by a process of selection. (See Harmony; Mode.)

(2) In organ-building, scale (mid. Eng., bowl of a balance, hence proportion) denotes the relation of the diameter or width of a pipe to its length, by which both amplitude and quality of sound are affected; the greater the diameter, the fuller and smoother the tone. A lesser diameter tends to produce a thinner and more pungent tone. In the pianoforte, the thickness of the strings in proportion to their length and tension is similarly a matter requiring careful adjustment, so that the quality of tone throughout the instrument may be evenly graded.

Scale (mid. Eng., shell, flake; Fr. *écaille*). Flat structure which occurs on or in the skin of many animals. In fishes and reptiles, the body is more or less covered with scales; birds have them

on the legs; butterflies and moths on the wings; and some mammals, e.g. the armadillo and the pangolin, have a protective coating of them. The tails of rats, mice, beavers, and some other mammals are provided with scales. In the fishes the scales are of a calcareous nature, and are secreted by the skin; but in reptiles, birds, and mammals they are of a horny character and grow out from the skin.

Scale Insects (*Coccidae*). Family of hemipterous insects including many species such as the Cottony Cushion Scale, San José Scale, Mussel Scale, etc. It is injurious to citrus fruits, apples, and other plants. Many kinds have a hard, scaly covering; others, called mealy bugs, have a waxy powdery exudation.

Scales. Weighing machine, described under that heading. See also Balance.

Scaliger, JOSEPH JUSTUS (1540–1609). French scholar. Born at Agen, he was the son of Julius



Joseph Scaliger,
French scholar
After Edelnick

Caesar Scaliger. His early education was directed by his father, but he later studied at the university of Paris. From 1563, with his patron Louis de Chastaigner, he was in Italy and England, then three years at Valence. A Protestant, Scaliger left France after the massacre of St. Bartholomew's eve, and in 1573 was professor at Geneva. In 1574, however, he returned, and until 1593 lived mainly with Chastaigner. At last he became a professor at Leyden, and he was still there when he died, Jan. 21, 1609. His last years were embittered by violent controversies with the Jesuits.

Inheriting a taste for study and spending a long life among books, Scaliger mastered with great rapidity and thoroughness Greek, Latin, and other languages. His work on chronology, which gives an idea, not only of his remarkable knowledge of ancient history, but of his gifts of judgement and application, was of supreme importance in fixing the dates of the leading events of the world, and his editions of Catullus, Manilius, and Eusebius bear further witness to his powers as a critic and com-

mentator. Consult History of Classical Scholarship, J. E. Sandys, vol. ii, 1908.

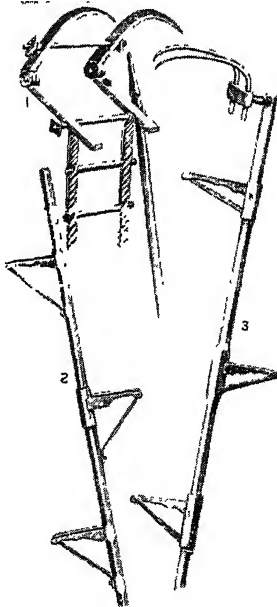
Scaliger, JULIUS CAESAR (1484–1558). French scholar. Born in Italy, he became a soldier in the



J. C. Scaliger,
French scholar

imperial service and fought in 1512 at Ravenna. In 1514, already something of a scholar, he entered the university of Bologna. In 1525 he settled at Agen, where he married and practised medicine, living there until his death, Oct. 21, 1558. Scaliger was a violent controversialist. Most of his works are Latin poems or commentaries dealing with the scientific works of Aristotle and other early writers. The erudition displayed made him the first scientist of his age, although no great discoveries have been attributed to him.

Scaling Ladder. Military ladder used in the assault upon fortified places. They were extensively used by commando parties during the Second Great War, in the battle for Fort Driant, Metz, and on a large scale during the battle for the Mareth Line. Similar ladders are used by fire brigades.



Scaling Ladders, as used in ancient warfare. 1 and 3, German. 2, Danish
From old prints

Scallop. Popular name for marine bivalve molluscs of the genus *Pecten*, of which about 20



Scallop with shell opened

species occur around the British coasts. The valves of the shell are more or less fan-shaped, and are winged at the hinge. They are usually brightly coloured, and the one valve is often convex while the other is flat. These molluscs can swim with some speed by rapidly opening and shutting the valves of the shell. There are a series of small ocelli upon the edge of the mantle. Probably all the pectens are edible, but only two species are eaten in Great Britain, the common scallop (*P. maxima*) and the quin (*P. opercularis*). About 200 living and nearly 500 extinct species are known. *Pron.* skol-lap. See Mollusca.

Scalp (Mid. Dutch *schelpe*, shell). Structure formed by the soft tissues which cover the vault of the cranium. It consists of three layers: the skin; the superficial fascia, a layer of fibrous tissue; and the occipito-frontalis muscle, with its aponeurosis or fibrous extension. Underneath the scalp is a layer of loose areolar tissue, which separates it from the periosteum or fibrous membrane, which is closely adherent to the bone.

The skin of the scalp is thicker than the skin in any other part of the body, and contains numerous sweat and sebaceous glands and hair follicles. The occipito-frontalis muscle moves the scalp and wrinkles the forehead. The scalp is abundantly supplied with blood-vessels, in consequence of which bleeding from wounds of the scalp is apt to be persistent and severe. Hence also such wounds tend to heal readily. See Anatomy; Brain.

Scalping. Custom of removing part of the skin, with hair attached, from an enemy's head. A substitute for the taking of head-trophies, it was practised by ancient Scythians, Celts, and Teutons. Developed in N. America in recent centuries, it was infrequent outside the Iroquois and Muskogee regions. Sometimes utilised as ritual offerings to sun or water, scalps were usually dried on hoops, painted underneath,

and displayed or worn as trophies, or mounted on poles for women's scalp-dances. The early white settlers encouraged scalping by bounties. See American Indians.

Scamander. Ancient name of the river Menderes (*q.v.*).

Scammony. Gum-resin obtained from the root of *Convolvulus scammonia* from Syria and Asia Minor. Scammony resin is a mixture of resins obtained from Ipomoea. The compound powder of scammony contains 50 p.c. of scammony resin. Scammony is a strong purgative and may be usefully administered in obstinate constipation, for threadworms, etc.

Scandal (Lat. *scandalum*, cause of offence). In law, a pleading or affidavit is scandalous which alleges anything unbecoming to the dignity of the court, or indecent, or offensive, or merely abusive—as where an allegation of crime, not material to the issue, is made. On application the court will strike out such a pleading or affidavit, and award costs against the party in fault. But however scandalous an allegation may be, if it is relevant to any issue in the case, it will not be struck out. See Libel.

Scanderbeg (c. 1403–67). Albanian hero. The son of an Albanian prince, his original name being George Castriot Swinamed. he early distinguished himself against the Turks, receiving from them the name of Scanderbeg, derived from Iskender, or Alexander, Beg, or Bey. After the overthrow of Albania by Murad II, Scanderbeg rose high in the Turkish service. In 1443 he returned to his people, and in a campaign of a single month recovered Epirus from the Turks. With his tiny army he defeated the 40,000 Turks who invaded Albania in 1444. Scanderbeg died of fever at Alessio (Lesh), Jan. 17, 1467.

Scanderoon. Alternative name for the Turkish seaport better known as Alexandretta (*q.v.*).

Scandinavia. Name of the European peninsula which is politically divided between Norway and Sweden. Denmark and Finland are sometimes understood to be included. The term grew from Scandia, an ancient name for the S. of Sweden, to which the term Scania (Swed. *Skåne*) is still applied. (See Denmark; Finland; Norse; Norway; Sweden.)

The Scandinavian lands are rich in antiquities. Human occupation of these lands and the Baltic shores lagged behind that of central Europe during the northward

retreat of the glaciers in early Palaeolithic times. S. Sweden was perhaps reached by wanderers in the Solutrian (*q.v.*) period, but rude stone and horn implements are scanty until, on the threshold of the Neolithic age, immigrants along the Atlantic coast penetrated to Jutland, and left traces of their semi-nomadic fisher life in the Danish kitchen-middens.

As the Stone Age progressed, the megalithic-building impulse reached Denmark and the opposite land. This culture may probably have felt the impact of bronze-using peoples shortly after 2000 B.C. Many implements betoken high skill, especially long Danish flaked daggers, rivalling those of predynastic Egypt. The prototypes of these daggers may have come from Bronze Age Britain, which apparently began to affect Scandinavia centuries before Norse influences came back in return.

Bronze Age culture apparently arrived with a new ethnic immigration along the Vistula and other routes from S.E. Russia, although other influences came along the amber routes from the Mediterranean. Interment in hollowed oak coffins, sometimes containing wool-len garments, was replaced by the burial in urns or cists of burnt remains. Although iron became general in S. Europe by 1000, several centuries elapsed before it began to displace Scandinavian bronze, which, like the flint-work, reached high levels of workmanship. Remarkable bronze war trumpets and diadems, as well as golden bowls, votive boats, and chariots, are extant. The material comfort arose from maritime and agricultural industry. Sailable ships, ox ploughs, and horse wagons are represented on rock-sculpturings, which also illustrate the sun-worship of the time. On the walls of a dolmenic tomb at Kivik appear engravings recalling the judgement scenes of the Egyptian Book of the Dead.

From about 500 B.C. iron appears, mostly at first in imported designs of La-Tène type. During the first four centuries A.D., Roman influence was pervasive. A massive silver bowl from Gundestrup, Jutland, bears hammered scenes in the classical manner. Hoards were deposited in moors, mostly with a votive intention, rather than in graves. One hoard from Vimose, of 4,000 objects, including a coat of mail, and dating to A.D. 250, is predominantly Roman; another 40 years later, from Thorsbjerg, and a still later

one from Nydam, including a clinker-built ship, 75 ft. long, mark the decline of Roman influence.

Local art became vigorous during the four centuries of the national migrations. This is often called the golden age, because of the large amount of gold remains, in the form of bars, collars, brooches, bracteates, and coins. Two golden horns, 3 ft. 9 ins. long, from Gallehus, Slesvig, melted down in 1802, but represented by reproductions, bore scenes of Valhalla and the underworld. This period was aided by the economic importance of the S. Baltic as the northern highway from the Atlantic to the Byzantine East.

The next three centuries cover the Viking time. During this, the silver age, Norse paganism was supplanted by Christianity, and the commingling of the two faiths is reflected in the contemporary art. Complete seagoing craft from ship-graves have greatly elucidated the seamanship of the time. It was then that Norwegian antiquities became most striking and plentiful. Silver filigree work displaying Irish influence was plentiful, and runic inscriptions preserve the history of rune-writing. The adoption of the Latin alphabet brought the Baltic lands into the general comity of Europe. *See* Bracteate; Denmark; Kitchen-midden; Norway; Rune; Sweden.

Scandium. One of the metallic elements. Its chemical symbol is Sc, atomic no. 21, atomic weight, 45.1. It is one of the predicted elements of Mendeléev. Its oxide was discovered by the Swedish chemist L. F. Nilson, in 1879, in euxenite, a form of mineral pyrochlore, occurring in Norway. Scandium is also found in monazite, thorite, and other rare minerals of Scandinavia, Finland, and Greenland; in tin ores and wolframite, generally with thorium, from which it is separated with great difficulty. It has been recognized in the solar spectrum. The oxide, a white powder resembling magnesia, is widely distributed.

Scania. Southern peninsula of Sweden. It comprises the area nearest to Denmark, and forms the S. portion of Gothland, differing in geological formation from the remainder of the country. The ancient kingdom of Scania, and now a province, it is a rich agricultural lowland, of which almost two-thirds is cultivated, and it exports butter and bacon.

Scansion (Lat. *scandere*, to climb). In prosody, the measuring into feet of a line of verse to test

its conformity with the laws of quantity or metre. *See* Metre; Prosody; Verse.

Scansores (Lat. *scandere*, to climb). Word formerly used by ornithologists for a division of the birds to include the parrots, woodpeckers, and others.

Scantling (Old Fr. *escantillon*). In joinery, shipbuilding, and masonry, the dimensions of a piece of timber or stone; by extension, a small piece of timber; also a trestle to support a cask.

Scapa Flow. Sea basin in the S. of the Orkney Islands, Scotland. It is almost entirely enclosed by Pomona, Burray, South Ronaldshay, Hoy, and Walls, and contains a number of small islands; 15 m. long, the breadth varies from 8 to 12 m.

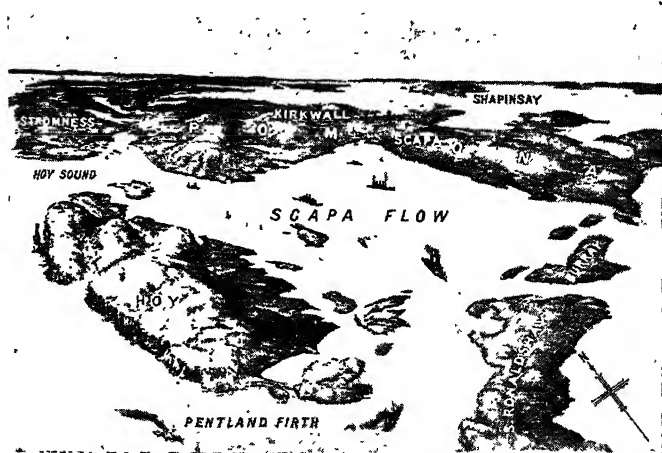
During the early part of the First Great War Scapa Flow was the main base of the British Grand Fleet. The German fleet was interned here in Nov., 1918, and most of it was scuttled, June 22, 1919, several of the ships being subsequently salvaged. At the outbreak of the Second Great War it again became a great naval base, but, owing to delay in production, the anti-submarine defences were incomplete. On Oct. 14, 1939, a German U-boat penetrated the anchorage and sank the Royal Oak (*q.v.*). The greater part of the Home Fleet was then withdrawn, returning early in 1940, when steel-mesh nets and electrically-controlled minefields had been laid across the harbour entrances.

On Oct. 17, 1939, Scapa Flow was bombed by enemy aircraft and the old battleship Iron Duke

(*q.v.*) was hit and settled upright in shallow water; she remained in that position for the rest of the war, being used as an accommodation ship. On March 16, 1940, a heavy force of bombers attacked the Home Fleet at anchor, but, although the enemy claimed to have sunk ships to the value of £32,582,000, little damage was done. One of the bombs falling on the village of Wraith killed the first civilian to lose his life in an air raid on Great Britain in the Second Great War. Raids continued throughout the war, but were mainly of nuisance value, doing nothing to interfere with Scapa Flow, which continued to be the principal base of the Home Fleet and for vessels escorting convoys to N. Russia.

Scapegoat. Term in the O.T. (A.V.) for one of the two goats brought to the altar on the Day of Atonement (Lev. 16). While one was sacrificed to the Lord, the other was the scapegoat, or, as the R.V. reads, for Azazel (*q.v.*). The high priest having confessed over the head of the scapegoat all the iniquities of Israel, the animal was sent away into the wilderness to the evil spirit (Azazel). It is conjectured that the ritual served as a warning against the worship of evil spirits. Similar ceremonies have been noted among races other than Jews, notably in Borneo. The term is often applied to one who has to bear the blame of another, *e.g.* the scapegoat of the family, the child with whom fault is found whatever the brothers or sisters may do.

Scaphoid (Gr. *skaphe*, skiff). In anatomy, name given to two



Scapa Flow. Map of the land-locked harbour in the Orkney Islands. It was the principal British naval base of the Grand Fleet in the First Great War, and of the Home Fleet in the Second Great War

bones: one of the bones of the wrist and one of the smaller bones of the foot; also known as the navicular bone. *See* Wrist.

Scapolite. An isomorphous series of rock-forming minerals ranging from marialite, a complex sodium aluminium silicate with sodium chloride, to meionite, calcium aluminium silicate with sodium carbonate; including wernerite and dipyre. Scapolite occurs as tetragonal crystals or grains in metamorphosed impure limestones, gneisses, and amphibolites, or as secondary mineral after lime-rich plagioclase in igneous rocks.

Scapula OR SHOULDER BLADE. Bone of the upper and back part of the thorax. It consists of a flat triangular part or body, with two projecting portions, the coracoid process and the spine, which terminates in an expansion known

Near the top is a surface for the attachment of the long head of the biceps muscle. The coracoid process arises from the upper border of the head, and serves to give attachment to the coraco-brachialis muscle, the short head of the biceps, and the pectoralis minor muscle. *See* Anatomy.

Scapula (Lat., shoulder). Ecclesiastical vestment of the R.C. Church. Consisting of a cloak or surtout worn over the shoulders, it is made of two strips of cloth put on over the head so that one falls in front and the other behind. It originated in the working frock of the Benedictines, symbolising by its shape the yoke of Christ, and was later adopted by other religious orders, its colour and length now varying according to the brotherhood of the wearer. A smaller scapula, 3 ins. by 2 ins., is worn under the clothes, and entitles the wearer to certain indulgences.

Scapular. Small medal of pewter or brass. It carries on the obverse an image of the Sacred Heart and on the reverse an effigy of the Virgin Mary. A scapular is generally worn instead of the small scapula. *See* Medal.

Scar (Gr. *eschara*, hearth, mark of a burn). Mass of fibrous tissue which forms in the healing of a wound. A scar will develop wherever an injury has been deep enough to sever the true skin. Important medico-legal questions turn upon questions relating to scars. The age of a scar can be roughly judged from its appearance.

At first a scar is red; it may then pass through a stage when it is brownish; and eventually it becomes white and glistening. The intervals of time, however, at which these changes occur, vary within very wide limits. A scar once produced is permanent, but in course of time it may fade so much as to be difficult of detection. Often, however, by rubbing the

part, it can be made more obvious, since the scar remains white, while the surrounding area becomes red. A scar cannot be entirely removed without producing another scar, but 20th century plastic surgery has done much to assist in the "toning down" of disfiguring scars. The shape of a scar will sometimes furnish evidence as to the way in which it was produced.

Scarab. Ancient gem in the form of a dung-beetle, especially *Scarabaeus* (*Ateuchus*) *sacer*. It originated in predynastic Egypt as an amulet, was made of polished or glazed stone, metal, or glazed faience, and was perforated lengthwise for suspension.

Besides unnamed forms, about 7,500 in public collections bear, engraved in intaglio upon the flat oval base, names or figures of divine, royal, official, or private persons, together with mottoes and magical formulae. By the XIIth dynasty scarabs became generally used as seals, commonly $\frac{3}{4}$ in. long, worn as pendants or mounted as signet rings. Some examples, as much as $\frac{1}{2}$ ins. long, of the XVIIIth dynasty, commemorated royal hunts. During the New Empire, heart scarabs with religious inscriptions were used as mummy pectorals. Egyptian trade carried them to Mesopotamia, W. Asia, and the countries round the Mediterranean, where Etruscan types were locally developed from Egyptian models. *See* Cylinder Seal.

Scarabaeus. Genus of dung-eating beetles, found in Europe, Asia, and Africa. They collect pellets of dung and bury them as food for themselves and their larvae. There are over 60 recognized species. *See* Beetle.

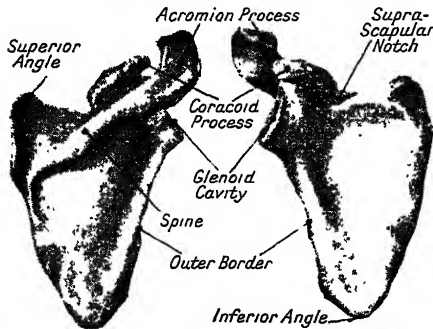
Scaramouch (It. *scaramuccia*, skirmish). Stock character in old Italian comedy. He was a braggart and a coward, usually masked, and dressed in black, and received a sound drubbing from Harlequin. An English play, *Scaramouch*, by E. Ravenscroft, was produced in



Scapula. The garment (A) as worn by Benedictine monks



Scarab. Ancient Egyptian gem



Scapula. Left, the bone from behind. The glenoid cavity for articulation with the arm bone occupies the upper and outer angle. The spine ends in the acromion process. Right, front aspect of the bone; the coracoid process comes from the upper edge

as the acromion. The anterior surface, i.e. that directed towards the thorax, is hollowed out into the subscapular fossa, to which are attached the subscapularis and serratus magnus muscles. The posterior surface is divided by the spine into an upper and lower part.

The upper part, known as the supraspinous fossa, lodges the supraspinatus muscle. The lower, or infraspinous fossa, gives attachment to the infraspinatus muscle. Two smaller muscles attached near the margin of this surface are teres minor and teres major. To the spine are attached the trapezius and the deltoid muscles. The acromion process forms the point of the shoulder, and overhangs the shoulder joint. It articulates with the clavicle or collar-bone. At the outer angle of the body is a thickened part, known as the head, the surface of which is an expanded area articulating with the humerus.



Scarabaeus beetle



Scarborough, Yorkshire. Two views of this popular North Riding holiday resort : left, North Bay swimming pool, with Castle Hill behind ; right, South Bay and harbour, seen from the esplanade

By courtesy of the Scarborough Corporation

1677, and a 20th century novel by R. Sabatini had the title Scaramouche. The term, supposed to be derived from the name of the Italian buffoon Scaramuccia (d. 1644), meant a rascal.

Scarborough. Mun. bor., fishing port, and watering-place of the N. Riding of Yorkshire, England.



It lies around two extensive bays, divided by the Castle rock, a peninsula 300 ft. high, jutting into the sea. It is 42 m. from York and 230 m. from London, and is served by rly. It consists of an old town, with a tidal harbour and fish quay, and a new town, connected by two bridges. The old town rises in terraces from the bay, and behind is Oliver's Mount (500 ft.), surmounted by a fine obelisk memorial to the fallen of the First Great War, and ringed by a motor-cycle road race circuit. Steamers go to various places. The buildings include S. Mary's church, the earliest parts of which date from the 13th century, S. Martin's, the ruins of the castle, the municipal buildings, and the museum. There are three stone piers, promenades, a marine drive, an open air theatre seating 6,000, public gardens (total area 400 acres), two large swimming pools, and many large hotels. In the grounds of the Spa, with its concert hall, are chalybeate and saline springs. A cricket festival is held every September, and international tennis and golf tournaments are held periodically.

Scarborough, the Saxon Skarðbruge, was early made a corporate town. It had 2 M.P.s 1295-1885, and one 1885-1918 ; Scarborough and Whitby is now the name of a co. constituency. A Cistercian house was founded 1198, and the castle was important. In the 17th

century the waters of Scarborough became known, and in the 19th it became a popular holiday resort. Pop. (est.) 44,000, more than doubled in the summer season.

During the First Great War Scarborough was twice shelled by the Germans. Shortly before 8 a.m. on Dec. 16, 1914, the battle cruisers Derfflinger and Von der Tann appeared and began to bombard it. Then for 30 minutes they rained shells on the front and the Grand Hotel. Some damage was done, and the casualties totalled 18 killed and over 100 wounded. On Sept. 4, 1917, a German submarine killed 3 persons. See Hartlepool, Bombardment of ; consult The History of Scarborough, ed. A. Rowntree, 1931.

Scarborough Lily (*Vallota purpurea*). Bulbous herb of the family Amaryllidaceae, native of S. Africa.



Scarborough Lily. Scarlet flowers of the S. African amaryllid
S. Leonard Bastin

The strap-shaped leaves arise direct from the large bulb, and are two or three feet in length. The flowers are borne in an umbel at the top of a straight, leafless stem, as long as the leaves. They are large, funnel-shaped, and of a rich scarlet colour.

Scarborough, EARL OF. British title held by the Lumley family since 1690. The founder of the

family was Sir Richard Lumley, an ardent royalist who was made an Irish viscount, 1628. His grandson Richard, 2nd viscount, was a staunch adherent of William III, who created him earl of Scarborough in 1690. From him the present holders of the title are directly descended. Richard, 4th earl (d. 1782), was deputy earl marshal. John, the 7th earl, was rector of Winterringham and prebendary of York. The 11th earl, Lawrence Roger (b. July 27, 1896), inherited the title in 1945 on the death of his uncle. The earls of Scarborough are related to the barons of Savile and the family of Sitwell (qq.v.).

Scarlatina. Alternative name for scarlet fever (q.v.).

Scarlatti, ALESSANDRO (1659-1725). Italian composer. He was born at Trapani, Sicily ; his early years are obscure, but his first known opera, *L'Errore Innocente*, was produced in Rome, 1679. A protégé of Christina of Sweden, he became master

Alessandro Scarlatti, Italian composer

of the court music at Naples, 1684, returned to Rome, 1702, and again to Naples, 1713, where he enjoyed great success, and where he died, Oct. 24, 1725. He was a prolific composer, writing over 100 operas, many of which have been lost. Notable among the survivors are *La Rosaura*, 1690, *Pirro e Demetrio*, 1694, *Mitridate Eupatore*, 1707, *Tigrane*, 1715, and *Griselda*, 1721. He wrote also some 500 chamber-cantatas, and some fine church music, including 200 masses, also 10 oratorios and a large number of motets, madrigals, etc.

His freshness of melody and clear sense of structure are re-

markable, and his influence on Italian, and especially Neapolitan, musical development was of great importance. His son Domenico (1685-1757) was a harpsichordist, and an able composer. *Consult* Alessandro Scarlatti, Dent, 1905.

Scarlet (Pers. *sagalat*, cloth). Word used for a bright red colour, so named because the cloth was frequently dyed scarlet. It is the colour used for the hats of cardinals and for various academic robes and hoods. The scarlet woman of Rev. 17 has been associated by extreme Protestants with the papacy.

Scarlet dyes are now usually aniline dyes, also known as azo-colours, as they contain one or more azo-groups (N:N), linking together aromatic radicles. Many of them are used in dyeing various fabrics or colouring varnishes. *See* Dyes.

Scarlet Fever. Acute infectious disease. The micro-organism presumably responsible was identified in 1923, when it was shown that the disease is a local infection of the throat by a specific streptococcus. The affection occurs in all parts of the globe, and some cases are always present in large towns. Epidemics of varying severity arise from time to time, 90 p.c. of the cases occurring in children under 10 years of age. Popular opinion credits infection to the small particles of the cuticle which are shed in the peeling stage, but this is certainly true only of early peeling.

The incubation period is from one to seven days, oftenest two to four. The onset is generally sudden, with vomiting, rapid rise of temperature, which may reach 104° or 105°, and, not infrequently, convulsions. The throat is dry, the tongue furred, the face flushed, and the skin dry and hot. Usually on the second day a rash, in the form of scattered red spots, appears, and spreads rapidly until it involves the entire skin, giving it a vivid scarlet hue. After two or three days it begins to fade and becomes of a darker colour, and as a rule has disappeared by the seventh or eighth day. The tongue is at first red at the tip, and furred in the centre, the red papillae, showing through the white fur, giving it the characteristic appearance known as strawberry tongue. The throat is generally uninfamed and the tonsils swollen, and in some cases the pharyngeal symptoms are severe. The fever gradually subsides with the disappearance of the rash. The

cuticle, or surface layer of the skin, is then shed in small flakes.

Besides the ordinary form of the disease, there is a variety—malignant scarlet fever—in which the toxic symptoms are very severe, and high fever, headache, and delirium may terminate in death within 24 to 48 hours of the appearance of the symptoms. Occasionally in a toxic form there may be haemorrhages into the skin, bleeding from the nose, and blood in the urine. In another variety—the anginose form—the throat symptoms are exceptionally severe.

Wherever possible, the patient should be sent to an isolation hospital. If treatment is undertaken at home, unaffected children in the house should be sent away, and the patient isolated. Careful nursing is important. Concentrated anti-toxin should be administered at once, and is the essential treatment. In the haemorrhagic form blood transfusion may be required. With high fever, sponging with tepid water or a cold pack may be necessary. When desquamation begins, the skin should be well rubbed every day with carbolised vaseline. The patient should not be permitted to come in contact with his fellows for a least eight weeks, and not then if discharge from ear or nose persists, which it may do for a long period, rendering the victim a "carrier."

Scarlet Letter, THE. Novel by Nathaniel Hawthorne published in 1850. The earliest novel produced in America to take a position among the classics of fiction, it is an intensely powerful study of diverse characters in the 17th century New England. The principal character is Hester Prynne, condemned to wear on the bosom of her gown the scarlet letter A, as an adulteress.

Scarlet Pimpernel, THE. Romantic novel by Baroness Orczy (*q.v.*). First published 1905, at the author's risk, after its rejection by 12 publishers, it was the fore-runner of many sequels over the next 30 years. A dramatic version of the story, written in collaboration with the author's husband, was produced by Fred Terry and Julia Neilson at the New Theatre, London, Jan. 5, 1905. The play brought success to the book. It remained permanently the leading play in Fred Terry's repertoire, and he toured in it for many years. It was revived in London seven times between 1907 and 1929. A notable film version, 1936, had

Leslie Howard in the leading part. Other screen *Scarlet Pimpernel*s have been Barry K. Barnes and David Niven. The story, laid in the French Revolution period, is of an English aristocrat, Sir Percy Blakeney, who as the *Scarlet Pimpernel* heads a small group who set themselves at great personal peril to rescue French aristocrats from the guillotine. Sequels include *I Will Repay*, 1906; *The Elusive Pimpernel*, 1907; *El Dorado*, 1913; *Lord Tony's Wife*, 1917; *The League of the S. P.*, 1919; *The Triumph of the S. P.*, 1922; *Sir Percy Hits Back*, 1927; *Adventures of the S. P.*, 1929; *The Way of the S. P.*, 1933.

Scarlett, SIR JAMES YORKE (1799-1871). British soldier. A son of the 1st Baron Abinger, he was educated at Eton and Trinity College, Cambridge. In 1818 he entered the army, rising to the command of the 5th Dragoon Guards. Scarlett is chiefly known as the leader of the heavy brigade at Balaclava. In 1855 he was knighted, and, having held a post at Aldershot, he was adjutant-general of the army, 1860-65, and commander at Aldershot, 1865-70. Scarlett was M.P. for Guildford from 1836 to 1841. He died in December, 1871.

Scarpa, ANTONIO (1747-1832). Italian anatomist. Born at Motta, near Treviso, June 13, 1747, he was educated at Padua and Bologna, and became professor of anatomy, at Medina, 1772, at Pavia, 1783, and in 1814 director of the medical faculty at Pavia. He made special studies of the ear, nose, eye, and heart. He demonstrated that the latter is supplied with nerves, and that arteriosclerosis is a lesion of the inner coats of the arteries. Scarpa became internationally famous as a clinical surgeon, and died at Pavia, Oct. 31, 1832.

Scarpanto or **KERKE.** Greek island of the Aegean. Lying S.W. of Rhodes, its length is 30 m. and its greatest width 8 m. The interior is mountainous, peaks rising to 4,000 ft. Aperi is the chief town. Its Greek name is Carpathos (*q.v.*).

Scarpe. River of France. It rises a few miles E. of St. Pol, in the dept. of Pas-de-Calais, flows E., and is joined by the Deule some miles W. of Arras. Thence canalised, it flows in a N.E. direction past Douai, and joins the Schelde near the Belgian frontier just N. of St. Amand.

In the First Great War the fifth battle of Arras (*q.v.*) consisted of

two distinct parts: the first, the British advance N. and S. of the Scarpe which made possible the second, the operation known as the storming of the Drocourt-Quéant line. The former is often described as a separate battle, known as the Scarpe, and this is the official British nomenclature.

Scarron, PAUL (1610-60). French author. A Parisian, he was ordained priest, spent his



Paul Scarron,
French author

youth in dissipation, and about 1637 was attacked by a terrible disease which left him a helpless cripple; but he bore his sufferings with unflinching gaiety and courage, made his house a centre for writers and wits, and in his last eight years was carefully tended by his young wife, afterwards Madame de Maintenon. Though his humour found scope in farical comedy, e.g. *Jodelet*, 1645, it mainly took the form of burlesque, as in his best known work, *Le Roman Comique*, 1651-57, written in reaction against the aristocratic romances of the salons. Scarron died Oct. 7, 1660.

Bibliography. Works, 10 vols., 1737; S. et le Genre Burlesque, P. Morillot, 1888; The Comical Romance, T. Brown and others, with biography by J. J. Jusserand, 2 vols., 1892; S. et son milieu, E. Magne, 1905.

Scattery. Island of co. Clare, Eire. It is in the estuary of the Shannon, 3 m. S.W. of Kiltrush. S. Senan founded a monastery here in the 6th century, and there are ruins of six churches, a round tower, and a holy well. On the S. point is a lighthouse.

Scaup Duck (*Nyroca marila*). Wild duck, winter migrant to Great Britain. The plumage is glossy black on the head, neck, and back, brown on the wings and tail, and white beneath in the male; the female being more soberly garbed in brown, grey, and white. The bird is common around the coasts and at the mouths of rivers in winter.

Scaurus, MARCUS AEMILIUS (163-c. 89 B.C.). Roman politician. In the war with Jugurtha he was bribed to conclude a peace favourable to that monarch, but escaped condemnation by securing his own nomination to the commission of inquiry. During his censorship in 109 B.C. he began the

Aemilian Way (q.v.). His son of the same name was accused of extortion in Sardinia in 55 B.C., but was acquitted.

Scavage. Name of a tax or duty formerly collected by various cities and towns of England on all goods displayed for sale within their boundaries. The word is derived from O.F. *escauver*, to inspect, and an alternative form was shewage. Scavage was prohibited by Henry VII. A scavenger was originally the official who collected it.

Scenario (It.). Sketch of the libretto and general plan of an opera (q.v.); also the written text of a cinema film.

Scene (Gr. *skênē*, Lat. *scaena*, covered place, stage). In drama, a subdivision of an act in a play. The term is also applied to the setting of an episode in a story; and to a public demonstration of feeling. Before the introduction of the drop curtain and scenery as adjuncts to a theatre, a change of scene was indicated by the use of screened recesses at the rear of the stage, by the text, or by the exit or entrance of a leading character. Modern spectacular plays may contain many scenes to each act; but the general tendency is to reduce the number of scenes to a minimum. See Act; Drama.

Scenes of Clerical Life. Three stories by George Eliot which, after appearing in Blackwood's Magazine, were published under this title in 1858. They are *The Sad Fortunes of the Rev. Amos Barton*, *Mr. Gilfil's Love Story*, and *Janet's Repentance*. These stories were George Eliot's first essays in fiction, and their skilful technique and deep human interest immediately established her reputation.

Scent (M.E. *sentend*, from Lat. *sentio*, I perceive). In the sense of a fragrant liquid concoction, this is described in the article *Perfume*. Botanically, scent is an odour possessed by the essen-

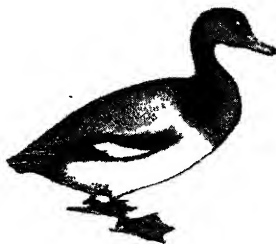
tial or volatile oils of plants. The trail of smell by which dogs and other animals keep track of their quarry is also known as scent.

Scepticism (Gr. *skepesthai*, to consider, doubt). In general, the tendency to doubt, the reservation of judgement as to the truth of things commonly regarded as certain. Among the ancient Greeks the first impulse to scepticism was given by the Sophists (q.v.), but it was first systematised by Pyrrho (c. 365-275 B.C.) of Elis, after whom it has been called Pyrrhonism, and his followers Pyrrhonists. He declared that it was impossible to acquire certain knowledge.

The doctrines of the Sceptics are expounded in the works of Sextus Empiricus (3rd century A.D.). The chief arguments against dogmatism are: the uncertainty of sense-data, which are affected by circumstances and the individual; the discrepancy of opinion regarding the same object, which excludes certainty of proof; principles are uncertain, since the facts on which they are based are uncertain; all *a priori* reasoning is fallacious. In modern times scepticism was revived by Montaigne, Bayle, and Hume: its extreme result is seen in the French materialism of the 18th century. See Freethought; Rationalism.

Sceptre (Gr. *skeptron*, staff). Staff used as an emblem of authority, especially of sovereignty. It is seen among Egyptian hieroglyphics, tipped by the lotus, the papyrus flower, or other emblem. In Homer it is the staff of an old man, but the use of a rod for chastisement may be one source of the symbol. An oath sworn by the sceptre is of special solemnity in the Iliad. The Roman sceptre, probably of Etruscan origin, was borne by the kings. On certain occasions, consuls, and generals, at the celebration of their triumphs, carried ivory sceptres, from which the marshal's baton may be derived.

In medieval Europe sceptres were surmounted by globes, crosses, lilies, or eagles. In the British regalia there are three sceptres, all used in coronation ceremonies: S. Edward's staff, a long gold rod, shod with a steel spike and bearing a mound with cross; the sceptre with dove, an elaborately wrought gold staff surmounted by a dove with open wings; and a more slender staff surmounted by a globe and cross. The first two sceptres were made for Charles II. See Regalia; Staff. *Prom. septer.*



Scaup Duck. A migrant to Britain

Schacht (HORACE GREELY) HJALMAR (b. 1877). German economist and politician. He was



Hjalmar Schacht,
German economist

born Jan. 22, 1877, at Ting-leff, Slesvig. After studying economics, he entered the Dresdner bank. During 1908-15 he was its deputy director; and in 1914-15 became also head of the Belgian issuing bank. From 1916 to 1923 he was the head of a huge combination of German banking companies, and then was appointed Reich high commissioner of currency. In this post he succeeded in re-establishing a stable currency after the post-war inflation. He was then made governor of the Reichsbank, gaining prestige abroad as well as at home as a financial genius. Disagreeing with the govt., he resigned and got into contact with Hitler. Again governor of the Reichsbank, he participated in the London economic conference of 1933 and became minister of economics in 1934. He then inaugurated a financial and economic policy which, by exploiting the property of Jewish and other refugees, and by enforcing barter deals upon smaller countries, made possible big armament schemes and eventually war. In 1937, however, Hitler found Schacht's policy too "orthodox" and forced him to resign from the bank and his ministerial post. He remained a minister without portfolio but, disagreeing with some aspects of the Nazi regime, was put into a concentration camp after the July, 1944, plot against Hitler. Liberated by the Allies, he was indicted as one of the chief war criminals at Nuremberg. Acquitted there, he also successfully appealed against the sentences of German denazification courts. He pub. *Account Settled*, 1950.

Schaff, PHILIP (1819-93). Swiss-born American divine. Born at Coire, Jan. 1, 1819, and educated at Tübingen, Halle, and Berlin, he went to America in 1843 to join the staff of the German reformed theological seminary at Mercersburg, Pa. He was professor in the union theological seminary at New York from 1869 until his death, and in 1870 he formed the American committee which assisted in the revision of the Bible, acting as its president from 1871 onwards. He died Oct. 20, 1893.

Schaff wrote and edited works including an exhaustive Study of the Creeds of Christendom.

Schaffhausen. A canton of Switzerland. It occupies the northernmost part of Switzerland, N. of the Rhine, and comprises three portions separated from each other by German territory. The N. and E. are mountainous. Numerous streams drain to the Rhine through fertile valleys such as the Klettgau. Forests



Schaffhausen, Switzerland. Falls of the Rhine, two miles below the city. Top, square in the old part of the city

clothe the uplands. The canton joined the Swiss Confederation in 1501; local affairs are controlled by elective legislature and executive councils. Its area is 114 sq. m. The pop. numbers about 53,000, most of which consists of German-speaking Protestants.

Schaffhausen. City of Switzerland, capital of the canton of the same name. It stands on the right bank of the Rhine, 25 m. N. of Zürich, and nearly 1,300 ft. above sea level. Above the city is the dominating tower of Munot, a 16th century building with a splendid terrace; to the W. of it is the Fasnstaub promenade. Within the city the chief edifices are the 12th century Romanesque basilica, once an abbey church, the 17th century town hall, and the museum containing the bell which is said to have inspired Schiller's Song of the Bell. Thirty-seven people were killed when, April 1, 1944, the city was bombed in error by the Americans. The U.S.A. made substantial payment in

reparation, a first instalment of \$1,000,000 being paid within ten days. Pop. 21,118.

Schamir. In Oriental legend, a creature no bigger than a barley-corn, which nothing could resist

It is said to have been employed by Solomon in shaping the stones for the building of the Temple, for which he was forbidden to use metal instruments.

Scharlieb, DAME MARY DACOMB (1845-1930). British surgeon. Born in London, daughter



Dame Mary Scharlieb,
British surgeon
Elliott & Fry

of William Candler Bird, she married in 1865 a Madras barrister, William Scharlieb. She received her medical education at Madras Medical College and at the Royal Free hospital for women in London, graduating M.B. in 1882. The following year she returned to India and did much valuable work among the Indian women, opening a hospital for them in Madras, and also teaching. First woman M.D. of London. 1888, M.S., 1896, she was lecturer

on obstetrics to the school of medicine for women in London, and was consulting gynaecologist to the Royal Free and the South London hospitals for women. Her interest in promoting rational sex education found expression in such books as *How to Enlighten Our Children*, 1918, and *Sexual Problems*, 1924, of which she was editor. She published *Reminiscences*, 1924. Created D.B.E. in 1926, she died Nov. 21, 1930.

Scharnhorst. The name of two German warships. The first Scharnhorst was an armoured cruiser completed in 1907. Displacing 11,600 tons on a length of 449 ft. and a beam of 71 ft., she had engines of 26,000 h.p. to give her a maximum speed of 22½ knots. She was armed with eight 8.2-in., six 6-in., and 24 smaller guns, and mounted four submerged torpedo tubes. Flagship of von Spee's squadron when he sank the British squadron at Coronel, Nov. 1, 1914, in the First Great War, she was herself sunk by Sturdee's squadron at the battle of the Falkland Islands, Dec. 8, 1914.

Laid down at Wilhelmshaven and completed in 1939, the second Scharnhorst was a battleship displacing 26,000 tons on a length of 741 ft. and a beam of 98 ft. She was powered by geared turbines developing 35,000 h.p. to give a maximum speed of 27 knots. Her armament comprised nine 11-in., twelve 5.9-in., fourteen 4.1-in., and sixteen 37-mm. guns. She carried four aircraft launched by catapult and had a complement of 1,461 officers and men.

On Nov. 23, 1939, the Scharnhorst fought the first important naval engagement of the Second Great War when she sank the British merchant cruiser *Rawalpindi* (*q.v.*). She later took part in the German invasion of Norway in April, 1940. On June 13, 1940, she was bombed by the Fleet Air Arm, and a week later damaged by torpedoes from the British submarine *Clyde*. Towed into Kiel for repairs, she was there attacked by Coastal Command aircraft on July 2 and set on fire. Again repaired, she put to sea early in 1941 against Allied shipping in the Atlantic.

With the *Gneisenau* she docked for refit at Brest, but was so persistently bombed by the R.A.F. that she was moved to La Pallice, where she was again attacked and so seriously damaged that she had to return to Brest for major repairs. On Feb. 12, 1942, the *Gneisenau* and *Scharnhorst* cleared Brest and, despite British air and

sea attack in the Channel (*see Gneisenau*), reached Kiel, where she was further bombed by the R.A.F. Repaired once more, she sought refuge in Altenfjord in N. Norway, only to be repeatedly bombed by the R.A.F.

Again made fit for action, she put to sea on Dec. 26, 1943, to attack a British convoy bound for Russia. Within a few hours she was intercepted by the cruisers *Norfolk*, *Belfast*, and *Sheffield*, and forced under the 14-in. guns of the battleship *Duke of York*, which scored an underwater hit. This reduced her speed, and she was sunk by a torpedo from the cruiser *Jamaica*. Fewer than 50 of her crew survived.

Scharnhorst, GERHARD JOHANN DAVID VON (1755-1813). German soldier. Born in Hanover, Nov. 12,



G. J. D. von Scharnhorst, German soldier

1755, he first saw service with the Hanoverian contingent in the Low Countries, 1793-95. In 1801 he entered the Prussian service and fought with great distinction against the French during 1806-07. The disasters of that campaign having revealed grave defects in the military system of Prussia, a commission of reorganization was appointed with Scharnhorst at the head. As a result of the reforms due to this commission, notably the introduction of universal military service, Prussia was able to make a vastly more effective fight against the French in the next war, the turning point in which was the victory over Napoleon at Leipzig in 1813. Scharnhorst received a wound at the battle of Lützen, from the effects of which he died at Prague, June 28, 1813.

Schässburg. Former German name of the Transylvanian town Sighisoara (*q.v.*).

Schaumburg-Lippe. Former republic of N.W. Germany. Surrounded by the Prussian prov. of Hanover, its area was 131 sq. m. and pop. about 50,000. It is hilly in the N. and flat in the S. Agriculture is carried on and coal mined. Bückeburg was the capital; Stadthagen the only other town. It originally belonged to the dukes of Schaumburg, and before 1918 was a principality governed by a prince assisted by a Landtag. It sent one member to

the Reichstag and one to the Bundesrat. After the revolution of 1918 the constitution of March, 1919, continued the existing Landtag of 15 members. Schaumburg-Lippe originated as an offshoot of the principality of Lippe, which in 1813 was divided into three portions for the three sons of its ruler. The last ruling prince was Adolf, a nephew of the last kaiser. After the Second Great War, it lay in the British zone of occupation.

Scheduled Castes. Official designation for certain sections of the Hindu pop. of India, also called Depressed Classes (*q.v.*).

Scheele, KARL WILHELM (1742-86). Swedish chemist. Born at Stralsund, Dec. 19, 1742, he was apprenticed to an apothecary named Bauch at Gothenburg, and afterwards acted as assistant to apothecaries in Malmö, Stockholm, Uppsala, and at Köping, where he ultimately purchased the business, and where he died, May 19, 1786.

Whilst engaged in the practice of pharmacy Scheele conducted numerous chemical investigations upon definite lines. He prepared oxygen from manganese dioxide and sulphuric acid, and afterwards from red oxide of mercury, the discovery being made independently of Priestley. The importance of his discoveries was not appreciated until later.

Scheelite. In mineralogy, calcium tungstate (CaWO_4), one of the minerals of tungsten. It varies considerably in colour from white and flesh to pink and green, often resembling feldspar, but shows a characteristic fluorescence under ultraviolet light. Scheelite is found in contact metamorphic deposits, especially where limestones have been mineralised by tungsten-bearing solutions emanating from an adjacent granite magma; it also occurs in veins and as a secondary alteration product of wolframite (*q.v.*). Scheelite is named after K. W. Scheele (*v.s.*).

Scheer, REINHARD (1863-1928). German sailor. He was born Sept. 30, 1863, and, joining the



R. Scheer, German sailor

navy, he served in the cruiser *Bismarck*, 1884-86, and in 1909-11 was chief of the staff to Von Holtzendorf when the latter commanded the High Sea Fleet. Regarded as one of the most energetic and able officers in

the German navy, he was commanding a battle squadron at Kiel when the First Great War broke out, and continued in that position until the end of 1915, when he became commander-in-chief of the High Sea Fleet. He commanded the German naval forces at Jutland (*q.v.*), with Hipper as second in command. On Aug. 11, 1918, the latter took over the chief command, when Scheer was appointed to succeed Holtzendorf as chief of the admiralty staff. He resigned in Jan., 1919. Scheer's conduct of the operations at Jutland has been the subject of some criticism. He gave his own account of the battle in Germany's High Sea Fleet in the World War, published 1920. He died Nov. 26, 1928.

Scheffel, JOSEPH VIKTOR VON (1826-86). German poet and romancer. Born at Karlsruhe,



JOSEPH VON SCHEFFEL
German poet

Born at Karlsruhe, Feb. 16, 1826, and educated at Heidelberg, Munich, and Berlin, he entered the civil service, but in 1852 abandoned it for literature. He travelled in Italy, and

there wrote *Der Trompeter von Sackingen*, 1854, a story in verse of the Thirty Years' War, Eng. trans. by F. Brunnov, 1877, and by J. Beck and L. Lorimer 1893; and *Ekkehard*, 1855, Eng. trans. by F. Delfs, 1872, a vivid prose story of the 10th century. Both works enjoyed phenomenal success. *Gaudamus*, a collection of songs and ballads, appeared in 1867 and was translated into English by Leland. 1872. He died April 9, 1886.

Scheffer, ARY (1795-1858). French painter. Born at Dordrecht, Netherlands, Feb. 10, 1795, of German extraction, he studied under his father, and in Paris under Guérin. His subject pictures, historical and religious, correct in drawing, and sincere, if sentimental, obtained an enormous vogue. Also a portrait painter, he is amply represented at Versailles. Scheffer died at Argenteuil, June 15, 1858.

Scheherazade. Character who recounted to the sultan Shahriar the stories of the Arabian Nights' Entertainments (*q.v.*). She gives her name to a symphonic suite by Rimsky-Korsakov, composed in 1888, in which a solo violin represents the narrator. This provided the score for a ballet—presented by Diaghilev in Paris, 1910. One of

the most sensational of its time. *Scheherazade* was designed by Bakst, with choreography by Fokine; the chief parts were danced by Karsavina and Nijinsky.

Scheidegg OR **SCHLDECK** Two Alpine passes in Switzerland, in the Bernese Oberland. The Great Scheidegg connects Grindelwald with Meiringen and has an alt. of 6,434 ft., it carries a mule path. The Little Scheidegg, between Grindelwald and Lauterbrunnen and 338 ft. higher, carries a mt. rly. which connects with the Eiger Glacier and Jungfrau rly.

Scheidemann, PHILIPP (1865-1939). German politician. Born at Cassel, July 26, 1865, and starting his career as a printer, he joined the Social Democratic party, editing Socialist newspapers. He entered the legislature in 1903, and in 1912, when the Socialist party was in temporary command of the Reichstag, he was elected first vice-president of the chamber. As head of the Social Democrats he came out on the side of the Kaiser at the outbreak of the First Great War. In Nov., 1918, Scheidemann was appointed secretary of state and later minister of finance. He was prime minister for a short time in 1919, resigning because he disapproved of the peace treaty. With the access of Hitler to power, he fled from Germany, and died at Copenhagen, Nov. 29, 1939.

Schelde OR **SCHLDT** (Lat. *Scaldis*, Fr. *Escaut*). River of W. Europe. It rises near Le Câtelet, Aisne dept., France, flows N. and N.E. through the dept. of Nord, and enters Belgium after passing Condé. It runs through the W. part of Hainault, which it separates from W. Flanders, traverses E. Flanders, which for a time it separates from the prov. of Antwerp, skirts the Waesland, and, after passing through Antwerp, enters the Netherlands near Doel. It then divides into two main streams. (1) the Hond or W. Schelde, which flows W. to the S. of the islands of N. and S. Beveland, entering the North Sea by a broad estuary at Flushing; (2) the E. Schelde, flowing in a N.E. direction, separating N. and S. Beveland from Tholen and Schouwen, and reaching the sea about 15 m. N. of the other estuary. The two branches are connected by the passage of Sloe.

The chief tributaries are, in France, the Sensée, Rahonelle, Haine, and Scarpe, and in Belgium the Lys, Dendre, and Rupel. Easily navigable and connected with numerous canals and canalised

tributaries, the Schelde is one of the greatest economic assets of Belgium, and one of the chief waterways of W. Europe. The chief towns on its banks are Cambrai, Valenciennes, Condé, Tournai, Oudenarde, Ghent, Termonde, and Antwerp. Total length, 250 m., of which 206 are navigable. The tide is felt up to the lock gates at Ghent.

From early times political circumstances in the Netherlands have caused difficulties in connexion with the navigation of the Schelde. The treaty of Westphalia, 1648, closed the mouth of the river to commerce between Spanish possessions and the United Provinces. In the 18th century Austria's attempts to obtain the opening of the river failed, but the treaty of Paris in 1814 opened it to all nations free of tolls. The treaty of 1830 laid down the principle of free navigation under joint Belgian and Dutch control, but left certain rights in Dutch hands which were abolished in 1863, the Netherlands receiving compensation of £750,000 from the interested powers.

When the Allied armies moved into the Low Countries after Germany invaded them in May, 1940, the Schelde became of strategic importance. It is the most westerly of three rivers flowing N. in roughly parallel lines, the others being the Dendre and Dyle. After the German break-through at Maastricht, the British were compelled on May 6 to withdraw from their positions on the Dyle, E. of Brussels, and retire on the W. bank of the Schelde. Here the line was held by seven Allied divs. with two in reserve, but rapid enveloping movements by German armour rendered the position precarious, and on May 23 it was abandoned.

After the British 2nd army failed to reach the British 1st airborne div. at Arnhem in Sept., 1944, the Allied command decided to open the Schelde estuary so that Antwerp could be used to support a general advance to the Rhine. Antwerp itself had been liberated on Sept. 4, but the Germans were still in possession of both shores of the estuary. The Canadian 1st army crossed the Belgian-Dutch frontier into Zeeland-Flanders on Sept. 16, liberating Terneuzen on the 21st; and by an amphibious night assault across the inlet called the Braakman, to the W. of Terneuzen, reached the Schelde again on either side of Hoofdplaat on Oct. 9. Breskens fell on the 22nd, after bitter street fighting, Fort Fredrik-Hendrik, key to the German positions S. of the Schelde, on

the 25th, Cadzand on the 29th, Knocke on Nov. 1, which cleared the S. bank. Farther E. Canadians captured Woensdrecht on Oct. 11, cutting the only road connecting the islands with the mainland, and began to advance into S. Beveland. British and Canadian units, landed across the Schelde in the S. of S. Beveland on Oct. 26, took in the rear the Germans opposing the Canadian advance from Woensdrecht. The two Allied groups linked on Oct. 29, liberating Goes, and next day they were in control of the whole island and were pushing on over the causeway connecting S. Beveland with Walcheren, the fighting for which (described under Walcheren) lasted until Nov. 7. Minesweeping of the Schelde estuary began on Nov. 2, and on Nov. 26 the first Allied ships started unloading in Antwerp.

Schelling, FRIEDRICH WILHELM JOSEPH (1775-1854). German philosopher. Born at Leonberg, Württemberg, Jan. 27, 1775, he studied at Tübingen and Leipzig, and became professor at Jena, 1798, later occupying chairs of philosophy at Würzburg and Munich, and from 1841 at Berlin. He died in Switzerland, Aug. 20, 1854. His philosophical views exhibit two distinct phases. In the first, starting from Fichte, he is a subjective idealist. To Schelling the *Ego* (self) is the only reality, the absolute, the universal principle which is opposed to a non-*Ego* and can be realized only by self-division and opposition. In the second, he is an objective idealist. Nature, as well as the *Ego*, has a real existence. In the first or negative phase, mind, in the second or positive phase, Nature, stands first as the subject of philosophical inquiry. Schelling's works, 14 vols., 1856-61, include *The World Soul*, 1797-99, and *System of Transcendental Idealism*, 1800.

F. W. J. Schelling,
German philosopher
After: G. Begas

Schenectady. City of New York, U.S.A., the co. seat of Schenectady co. It stands on the Mohawk river, 18 m. N.W. of Albany, and is served by rlys. and the N.Y. barge canal. Here are the principal workshops of the American Locomotive co., and the laboratories of the General Electric co. As a result of the emphasis on scientific research, 6 p.c. of the pop.

have university degrees. In the laboratories are scientific workers of all nationalities, several of whom are Nobel prize winners. Permanently settled in 1662, Schenectady became a borough in 1765 and was chartered as a city in 1798. Pop. 87,549. *Pron.* Skenek'-tady.

Scherer, EDMOND HENRI ADOLPHE (1815-89). French critic. Born in Paris, April 8, 1815, he became successively Protestant minister at Strasbourg, and professor of theology at Geneva, but devoted himself to literature after his changed religious views had compelled him to leave the Church in 1850. His *Études Critiques sur la Littérature Contemporaine* and other critical writings are marked by sound scholarship, fine taste, and a pronounced ethical bias. He died March 16, 1889. His *Essays on English Literature* were translated by G. Saintsbury in 1891. *See* Life, O. Gréard, 1890.

Scherzo (It., a jest). Term applied to a movement in a symphonic composition having a playful, humorous, or capricious character. It may be said to have developed from the Haydn Minuet and Trio—in which form it is generally written—although the term was used before his time. Beethoven found in it a congenial channel of expression for his boisterous sense of humour, and in his hands it attained a recognized importance. Later composers have also written scherzos, though often their character is light and graceful rather than humorous. The term is occasionally given to an independent composition, such as Chopin's Scherzos for the piano-forte. *Pron.* skaartso.

Scheveningen. Watering-place of the Netherlands, in the prov. of S. Holland. It lies on the North Sea coast, 3 m. N.W. of The Hague of which it is a suburb and with which it is connected by rly., tram, and the fine Old Road, laid down in 1666. It is the principal bathing resort of Holland. The herring fishery from the port is important, and fishing nets, sails, etc., are manufactured. Off Scheveningen the English defeated the Dutch under Tromp, who was killed, in 1653, and the Dutch under De Ruyter defeated the English and French in 1673. It suffered damage during the Second Great War in the course of the construction of the German Atlantic defences.

Schiaparelli, GIOVANNI VIRGINIO (1835-1910). Italian astronomer. Born at Savigliano, in Piedmont, March 14, 1835, he was educated at Turin university,

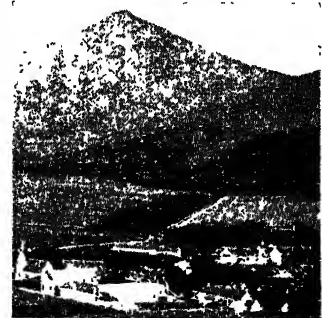
Berlin, and Pulkova. He became assistant astronomer at Milan, 1859, and director 1862, a post he held until his retirement in 1900. He was awarded the Lalande prize of the French Academy, 1868, for his work on the connexion between comets and meteor showers. Schiaparelli is best known, however, for his discovery of the so-called canals of Mars, a discovery announced by him in 1877, and a subject of controversy among astronomers for many years. He died at Milan, July 4, 1910. *See* Mars; Mercury; *Pron.* Skyapparell'y.

Schicklgrüber. Original name of the father of Adolf Hitler (*q.v.*).

Schick Test. Test for determining susceptibility to diphtheria. Schick test toxin is obtained from the diluted filtrate of a mixture of *Corynebacterium diphtheriae*. A small amount of the toxin is injected between the layers of the skin, and an area of redness appearing in 24 to 48 hrs. indicates a positive reaction, i.e. insufficient diphtheria antitoxin in the patient's blood to render him immune to the disease. It is thus possible to determine if immunisation is required, or if a second injection of immunising serum is necessary.

Schiedam. Town of the Netherlands, in the prov. of S. Holland. It lies on the Schie, a tributary of the Maas, 3 m. by rly. W. of Rotterdam, and is the junction for the Hook of Holland and the Delt-The Hague rly. lines. The chief industry is the distilling of gin (Holland). Candles are also made and there is a large dry-dock. Pop. 62,624.

Schiehallion. Mountain of Perthshire, Scotland. It is 11 m. W.N.W. of Aberfeldy, and rises in a shapely cone to 3,547 ft. The ascent is straightforward. Here in 1774 Nevil Maskelyne conducted



Schiehallion, Scotland. The Perthshire mountain, from the north-west. In the foreground is Kinloch Rannoch

his experiments in determining the earth's mean density. *Pron.* Sheh'-ion.

Schiller. In mineralogy, term applied to a nearly metallic lustre shown by certain mineral surfaces, as in hypersthene, etc., caused by the interference of light reflected from thin plates of minute mineral inclusions within the host crystal.

Schiller, JOHANN CHRISTOPH FRIEDRICH VON (1759-1805). German poet and dramatist. He was born at Marbach in Württemberg, Nov. 10, 1759. His father was an army surgeon, and the boy's childhood was spent in several small Württemberg towns. Ultimately the family settled in Ludwigsburg, where, in 1773, the duke Karl Eugen of Württemberg claimed Schiller as a pupil of his newly established military school. The young poet was in the first instance educated as a jurist, but exchanged law for medicine as the lesser of two evils, and in 1780 began practice as an army surgeon in Stuttgart. In the following year his first play *Die Räuber* (The Robbers), which had been composed surreptitiously at school, was published, and shortly afterwards produced at Mannheim.

Its success was extraordinary, and Schiller decided to devote himself to literature; he fled from Stuttgart, and in the following years, amidst disheartening privations, completed two other plays, *Fiesco*, 1783, and *Kabale und Liebe* (Love and Intrigue), 1784, both, like the first, in prose. With these three plays Schiller established himself in the first rank. At Dresden and Loschwitz, Schiller completed *Don Carlos*, 1787, his first drama in classical form.

Through Goethe's agency he was appointed to an unsalaried professorship in the university of Jena, and in 1790 he married Charlotte von Lengefeld. For several years he abandoned dramatic poetry in order to study history and subsequently aesthetics. In 1788 he published the first volume of a *History of the Revolt of the Netherlands*, and in 1791 a popular *History of the Thirty Years' War*; while in the field of aesthetics his chief writings are the brilliant *Letters on the Aesthetic Education of Man*, 1795, and *On Naive and Sentimental Poetry*, 1796.

In 1799 Schiller again turned to dramatic poetry with *Wallenstein*, a powerful historical tragedy in three parts. This was followed by a series of dramas displaying an interesting variety both in the nature of their subjects and in the method



After A. Tischbein

of treatment. *Maria Stuart*, 1800, presents with insight the psychological conflict of Mary Stuart's last days; *Die Jungfrau von Orleans* (The Maid of Orleans), 1801, frankly described as a "romantic" tragedy, redeems France's most romantic heroine from the obloquy of Voltaire's treatment of her; *Die Braut von Messina*, 1803, a tragedy in classic form, even to the extent of being provided with choruses, contains some of Schiller's finest poetry; while in his last work, *Wilhelm Tell*, 1804, he produced a drama of panoramic breadth, filled with the new spirit of political liberty set free by the French Revolution.

From 1794 onwards Schiller enjoyed the intimate friendship of Goethe, which stimulated not merely his dramatic work, but also his wonderful series of ballads. The most familiar of these are *Der Taucher* (The Diver), *Der Handschuh* (The Glove), *Der Ring des Polykrates*, *Die Kraniche des Ibykus*, *Der Gang nach dem Eisenhammer*, *Der Kampf mit dem Drachen*, and *Das Lied von der Glocke* (The Song of the Bell). In poems again like *Die Kunstler*, *Der Spaziergang*, *Das Ideal und das Leben*, *Die Gotter Griechenlands*, Schiller clothed his philosophic ideas in lyric form. From 1799 till his death, May 9, 1805, he resided in Weimar.

Schiller is Germany's greatest dramatist, and by the Germans themselves is considered in a peculiar sense their national poet. The judgement of foreign lands has not, however, endorsed the high claims which his own countrymen make for his plays. His mastery of dramatic construction, the vitality

of his character-drawing, and his noble blank verse assure him the foremost place; his personal and political idealism forms a fitting close to a century that was dominated by the ideals of Enlightenment. *See Germany: Language and Literature. Pron.* Shiller.

J. G. Robertson

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Schipperke (Flem., little skipper). Small tailless dog. It is bred in Belgium, where it is kept as a watch dog on barges. It is black in colour, with upstand-



Schipperke. Esme of Greta, a champion of this Belgian breed

ing ears and a small ruff round the neck. It is of the same group as the Pomeranian and Eskimo dogs. It was introduced to Great Britain about 1880.

Schirach, BALDUR VON (b. 1907). German politician. He was born May 9, 1907, at Weimar, received a public school education and studied literature at Munich after joining the Nazi party in 1924. In 1928 he was appointed leader of the Nazi students' organization, and in 1930 was made head of the Nazi youth associations. In 1932 he became fuhrer of Hitler youth. Subsequently he entered the Reichstag and played an active part in the systematic anti-Christian movement among German youth, as well as in the party cabinet. He did some journalism, and wrote third-rate propaganda verse. In 1940, after serving in the army, von Schirach

was appointed Gauleiter of Vienna. His actions in this office brought him before the Allied war crimes tribunal at Nuremberg where he confessed to increasing doubts of Hitler and Nazi policy; he was sent to prison for 20 years.

Schism (Gr. *schisma* a rent, split). Theological term applied usually to a rupture or division in the Christian Church. Strictly speaking, it is only applicable to a revolt against the recognized ecclesiastical authority or a departure from the historic teaching or order of the Church. The great schism between the East and the West took place in 1054, when Pope Leo IX excommunicated the whole Eastern Church, the chief point of disension being the rejection by the Oriental churches of the doctrine of the Procession of the Holy Ghost from the Father and the Son. What is known as the Great Schism in the Roman Church existed from 1378 till 1417, having taken place at the election of a successor to Pope Gregory XI. From the point of view of the R.C. Church, all bodies of Christians who do not acknowledge the supremacy of the pope are in a state of schism. See Great Schism; Reformation. Pron. sizm.

Schist (Gr. *skhistos*, split). In geology, name given to metamorphic rocks of a fissile character. Such rocks consist of thin films or plates of such minerals as mica, or a fibrous one like tourmaline, tremolite, running through the main structure. Schistose rocks are highly crystalline, and the rocks are known as mica-schist, chlorite-schist, hornblende-schist etc., according to the characteristic mineral present. They are found in regions where there have been mountain-building movements, such as Scotland, Scandinavia, the Alps. See Metamorphic Rocks. Pron. shist.

Schizanthus. Genus of annual herbs of the family Solanaceae. They are natives of Chile. See Butterfly-flower. Pron. sky-zanthus.

Schizocarp. In botany, a dry fruit which splits either longitudinally or transversely into one-seeded portions. See Fruit.

Schizomycetes (Gr. *skhizein*, to split; *mykēs*, mushroom). Class of microscopic plants better known as bacteria. See Bacteriology.

Schizophrenia (Gr. *skhizein*, to split; *phrēn*, mind). Term coined by Eugen Bleuler, a Swiss psychologist, for a mental disorder (*q.v.*) characterised by detachment from the world without, and abnormal psychological reactions within.

The condition generally manifests itself in youth, some strain often bringing into the open a flaw already present in the mental structure. Heredity appears to have no part in the disorder, for which "shock" methods, *e.g.* administration of insulin, and frontal leucotomy (surgical separation of the forebrain), offer no remedy. The eccentric, withdrawn, difficult personality is more liable to fade into the condition, less likely to be restored to mental balance. The brain cells of schizophrenics examined after death exhibit no abnormality. Pron. skits-o-freen-ya. See Mental Disorder.

Schlegel, AUGUST WILHELM VON (1767-1845). German critic and Orientalist. He was born at Hanover, Sept. 8, 1767. Having studied theology at Göttingen, he abandoned it, and in 1798 became professor of literature and art at Jena. During 1801-04 he was lecturer at Berlin. He was secretary to the crown prince of Sweden, 1813-14, and from 1818 until his death, May 12, 1845, he was professor at Bonn. Translations of Shakespeare's plays, completed by Tieck, served to establish Shakespeare's renown in Germany, and form Schlegel's title to fame. Pron. Shlaygel.

Schlegel, CARL WILHELM FRIEDRICH VON (1772-1829). German literary critic and historian. He was born at Hanover, March 10, 1772, brother of A. W. von Schlegel, and studied at Göttingen and Leipzig. A passionate love affair suggested Lu-

Friedrich v. Schlegel,
German critic

comde, 1799, a novel which was never completed, but gained notoriety for its unconventionality. Later Schlegel collaborated at Jena with his brother in *Das Athenäum*, a journal devoted to the interests of romanticism, and wrote in it his brilliant *Fragmente*, descriptive of the Romantic doctrine, of which he was the foremost exponent. He joined the R.C. church and entered the Austrian public service. He died at Dresden, Jan. 11, 1829. Schlegel's greatest contribution to letters is *Ueber die Sprache und Weisheit der Indier* (*Language and Wisdom of the Indians*), 1808, written after five years' study of Sanskrit. It formed the groundwork for the study of Indian philology.

Schleicher, KURT VON (1882-1934). German politician. Born at Brandenburg, April 7, 1882, he joined the army in 1900, held staff posts during the First Great War, and in 1918 organized an anti-Communist volunteer corps. Head of the war ministry 1929, he was thought to have helped in engineering the fall of Brüning in 1932. He retired from the army to become defence minister under Papen. Hindenburg appointed Schleicher chancellor on Dec. 2, 1932, but his failure to reconcile the parties of Hitler and Papen led to his resignation within two months. In the "blood bath" of June 30, 1934, Schleicher and his wife were shot dead by the Nazis. Pron. Shly-her.

Schleiermacher, FRIEDRICH ERNST DANIEL (1768-1834). German theologian and philosopher.



F. Schleiermacher,
German theologian

He was born at Breslau, Nov. 21, 1768, and educated at Halle, where he became a professor in 1804. He took a prominent part with Fichte in founding the university of Berlin, where he was appointed professor of theology in 1810. He died Feb. 12, 1834. The great task of his life was an attempt at a reconstruction of theology, in which the systems of Spinoza, Kant, and Christianity should be reconciled. With him all knowledge is provisional, and any dogmatic statement taken literally becomes a myth. Even the personality of God is nothing more than a symbol. With him the good and the reasonable are identical. His chief work was *Ueber die Religion*, 1799. Pron. Shly-er-mah-her.

Schlestadt (Ger. *Schlettstadt*). Town of France, in the dept. of Bas-Rhin. It lies on the river Ill, 21½ m. by rly S.S.W. of Strasbourg, and is a rly. junction. There are industries in metal-working—notably wire gauze—soap, brewing, and hosiery, and a considerable trade in local vine and agricultural products. The Tour de l'Horloge is a massive tower, part of the old fortification, and the church of St. George, 12th-15th centuries, and of Sainte-Foi, founded in the 11th century, are noteworthy. Schlestadt was a royal fief in Merovingian times, and became a free city of the empire under the Hohenstaufens. Taken by the French in 1634, it was fortified by Vauban

in 1676, and, captured by the Prussians, Oct. 24, 1870, remained in German possession until 1918, its fortifications being demolished in 1872. Pop. est. 11,000.

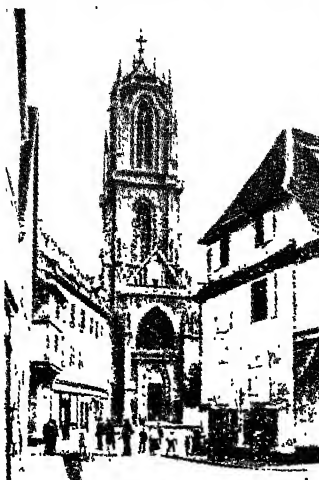
Schleswig. Details of this German prov. will be found under its Danish spelling of Slesvig.

Schley, WINFIELD SCOTT (1839-1911). American sailor. Born at Richfields, Maryland, Oct. 9, 1839, he served in the Federal navy during the Civil War. In the Arctic, 1884, he rescued Greely near Cape Sabine. In 1898 he commanded the flying squadron and played a prominent part in the battle of Santiago de Cuba. Rear-admiral the same year, he was appointed c.-in-c. of the S. Atlantic station, and retired in 1901. He died Oct. 2, 1911. *Pron. Sly.*

Schlieffen, ALFRED, COUNT VON (1833-1913). German soldier. Born in Berlin, Feb. 28, 1833, he fought in the Prussian armies in the wars of 1866 and 1870, and served as chief of general staff from 1891 to 1907. While in that post he worked out what became known as the Schlieffen plan, which set out the strategy by which Germany should be enabled to win a European war. On the E. front it produced the victory of Tannenberg and the campaigns around Lodz and Warsaw. On the W. front, however, his conception of a wide encircling movement, leading to an attack on Paris from the rear, was modified and so did not attain its full effect. Schlieffen died Jan. 4, 1913, and so did not live to see his plan put into partial effect.

Schliemann, HEINRICH (1822-90). German archaeologist. Born at Neu-Buckow, Mecklenburg-Schwerin, Jan. 6, 1822, he spent some years in commerce, establishing himself in St. Petersburg, 1846, where he amassed a fortune during the Crimean War, having previously become a citizen of the U.S.A., 1850. Acquiring several European languages and ancient Greek, he settled in Athens, 1868, and devoted himself to digging ancient sites, thereby revealing a long-forgotten Aegean civilization. The treasure he unearthed at Hissarlik, 1870-73 (described in Troy and its Remains, 1875) was retained and sent to Berlin. That found at Mycenae, 1876, went to Athens. He subsequently dug Orchomenos, 1881-82, and Tiryns, 1884-85. He died at Naples, Dec. 26, 1890. *Pron. Shloemahn.*

Schlier. In geology, name given to deposits of blue-grey clay in Hungary and parts of S. Europe



Schlestadt, France. Tower of the church of S. George

A subdivision of the Miocene, the schlier is an important source of salt and gypsum. *Pron. Shleer.*

Schlippe's Salt. Sodium thioantimonate or sulphantimonate. It is prepared by dissolving antimony trisulphide, sulphur, and caustic soda in the requisite quantity of water and crystallising the salt which is formed. Schlippe's salt appears in the form of yellowish crystals and is employed in photography.

Schlüsselburg. Town of the R.S.F.S.R. It is 20 m. E. of Leningrad, and stands on the Neva, where it issues from Lake Ladoga. Under the name of Oryeshkek (little nut) it was originally founded as a defence against the Swedes, by whom it was captured in 1308, and renamed Noteburg (nut-town). In 1702 Peter the Great recaptured it. The old fortress is now used as a prison. On Sept. 7, 1941, German forces captured Schlussselburg, thereby cutting off Leningrad from land communication with the rest of Russia. The town was recaptured by the Russians in Jan., 1943. Pop. est. 8,000. *See Leningrad, Siege of.*

Schmalkalden. Town of E. Germany, in Thuringia, before 1945 in Prussia. It stands on the river Schmalkalde, in a valley of the Thuringian Forest, 45 m. S.E. of Cassel. It has important saline springs, and there are manufactures of steel and iron. In the Rathaus the articles of the League of Schmalkalden (*v.i.*) were drawn up during 1530-31. There is a monument to Karl Wilhelm (1815-73), the composer of the Wacht am Rhein, and a native of the town. The church of S. George

(1450) and the town hall (1419) are also noteworthy. After the Second Great War it came within the Russian zone of occupation. Pop. (1950) 12,500.

Schmalkalden, LEAGUE OF. Alliance of the German Protestant princes and imperial cities, together with Switzerland and Denmark, Dec. 31, 1530, and Feb. 27, 1531. Under the guidance of the elector of Saxony and the landgrave of Hesse, the alliance was formed to defend the Protestants against the political oppression of Charles V. So strong was the league and so embarrassed was the emperor by foreign wars that he bowed to the league in 1532 and granted the peace of Nuremberg. Luther drew up the Articles of Schmalkalden in 1536. In 1546 Charles V outlawed, and made war on, the league, whose forces, under the elector of Saxony, were defeated at Muhlberg, April 24, 1547. This broke up the league. Its work was, however, completed by Maurice of Saxony, who secured freedom of religion to the Protestants in 1552 by the treaty of Passau (*q.v.*). *See Muhlberg.*

Schmidt, JOHANN FRIEDRICH JULIUS (1825-84). German astronomer. Born at Eutin, he entered the Hamburg observatory 1842, was appointed assistant observer at Bonn, 1846; observer at Olmutz, 1853; and director of Athens observatory, 1858, a post he held till his death. In 1876 he discovered the new star in Cygnus, Nova Cygni. Schmidt made a special study of the moon, publishing a revised chart of its physical features, 1877, and a new chart, 1878, and of variable stars.

Schmidt Plate. Correcting plate invented by B. Schmidt in 1930 for astronomical telescopes. The paraboloid mirror such as is used in an ordinary reflecting telescope will bring to a perfect focus only rays from those stars within a few minutes of arc of its axis. Star images at the edge of the field of view are drawn out into comet-like patches by a defect called coma. The Schmidt telescope has a spherical mirror (which has no unique axis) and the resultant spherical aberration (*q.v.*) is corrected by a thin, specially figured plate of glass. Good images are thus obtained up to about 7° on each side of the axis, and fast cameras can be made for direct star photography and for spectrographic work. The biggest, on Mount Palomar (*q.v.*) in California, is 48 ins. across. Industrial applications of

the device include the projection of bright undistorted images in television.

Schnabel, ARTHUR (b. 1882). Austrian pianist and composer. Born at Lipnik, April 17, 1882, he



Artur Schnabel,
Austrian pianist

studied under Leschetizky in Vienna, and gave his first concert in 1896. A virtuoso performer especially of Beethoven (almost all of whose piano works he recorded for the gramophone), he achieved world fame and made repeated tours. He taught the piano at Berlin state academy of music, 1926-31. Schnabel wrote a piano concerto, string quartets, symphonies, piano pieces, and songs; edited violin and piano sonatas by Mozart and Brahms; and published *Reflections on Music*, 1935; and *Music and the Line of Most Resistance*, 1942.

Schnapps. Name for a spirituous liquor akin to gin. The word is the German form of Dutch *snaps*, a dram. See *Gin*.

Schneeberg (Ger., snow mountain). Name of several German and Austrian mts., the highest of which, alt. 6,900 ft., 40 m. S.W. of Vienna, has a cog wheel rly. for sightseers.

Schneeberg is also a town in Saxony, 11 m. S.S.E. of Zwickau. An impressive Gothic church, S. Wolfgang, 1516-40, has paintings by Lucas Cranach the elder, and there is a restored town hall of 1527-48. From the 16th century there has been mining, originally for silver, now for cobalt, bismuth, nickel, and uranium. The town is a centre of lace making, and produces a famous snuff. Pop. 9,492.

Schneekoppe. Mt. of Germany. It is the highest point of the Riesengebirge or Giant Mts., the loftiest section of the Sudeten Mts. Height 5,260 ft.

Schneidemühl (Pol. Pila). Town of Pomerania. It was a rly. junction of some importance, 150 m. E.N.E. of Berlin, and, surrounded by large woods, had a timber industry (its German name means sawmill), engineering works, starch, brick, and glass factories. A pleasant town with pre-1939 pop. 43,180, it was damaged during the Russian advance in 1945 when, surrounded by the Russians on Feb. 1, it did not surrender until Feb. 14. It lies in the part of Germany placed under Polish rule by the Potsdam agreement.

Schneider Trophy. International trophy presented in 1913 by Jacques Schneider (1870-1928), a member of the French firm of armament makers, an engineer, and an aeronaut, to encourage improvement of the speed and seaworthiness of seaplanes. It was open to competition by seaplanes of all nations.

The trophy race was flown in laps over a triangular course, and the competing aircraft underwent an endurance test by remaining anchored in the open throughout the night before the race. By winning the contest for the third successive time in 1931, Great Britain obtained permanent possession of the trophy. The winning seaplane, the *Supermarine*, was the basis of the R.A.F. fighter aircraft the *Spitfire* (*q.v.*). See *Houston, Lady*; *Sassoon, Sir P.*

the critical negotiations in July-Aug., 1914, was based on instructions from Berlin, which left him unable to produce any plan to avoid a rupture between France and Germany. Schoen published his memoirs in 1921, and lived until April 24, 1933.

Schnörkel (Ger., spiral). Device to prolong underwater endurance of a submarine. A submerged submarine depends for its motive power upon electric motors run by accumulators. These are charged by generators driven by the Diesel engine used for surface cruising. When recharging batteries the submarine normally must surface, as a running engine would not only absorb all the air, but its exhaust would create a poisonous atmosphere. Early in 1944 the German navy introduced the *Schnörkel*, two extendable shafts projecting

SCHNEIDER TROPHY WINNERS 1913-31

Year	Winner	Aircraft	Engine	Av. speed (m.p.h.)
1913	M. Prevost (Fr.)	Deperdussin	160 h.p. Gnome	45.75
1914	C. Pixton (G.B.)	Sopwith	100 h.p. Gnome	86.8
1920	L. Bologna (It.)	Savoia	550 h.p. Ansaldo	107
1921	G. Briganti (It.)	Macchi VII	200 h.p. Fraschini	111
1922	H. Baird (G.B.)	Supermarine	450 h.p. Napier	145.7
1923	D. Rittenhouse (U.S.A.)	Curtiss	465 h.p. Curtiss	177.38
1925	J. Doolittle (U.S.A.)	Curtiss	600 h.p. Curtiss	232.57
1926	M. Bernardi (It.)	Macchi	850 h.p. Fiat	248
1927	S. Webster (G.B.)	Supermarine	360 h.p. Napier	281.68
1929	F. Waghorn (G.B.)	Supermarine	1,800 h.p. Rolls Royce	328.63
1931	J. Boothman (G.B.)	Supermarine	2,300 h.p. Rolls Royce	340.08

Schnitzler, ARTHUR (1862-1931). Austrian dramatist and novelist. Born in Vienna, May 15, 1862, he studied medicine and practised as a doctor there for several years. He took deep interest in literature and the stage, and made a success with his witty series of short plays of Viennese life, *Anatol*, 1893 (paraphrased for the English stage by H. Granville Barker, 1911). Other plays of Schnitzler, marked by spirited dialogue and neat technique, include *Liebelel*, 1896, Eng. trans. 1914; *Reigen*, a series of ten dramatic dialogues, 1896-97; *Der Grune Kakadu*, 1899, Eng. trans. 1913; *Lebendige Stunden*, 1902; *Fink und Fliedermaus*, 1917. His fiction includes short stories, *Die Frau des Weisen*, 1898; *Bertha Garlan*, 1900, Eng. trans. 1913, and the novel, *Fraulein Else*, 1924. He died Oct. 21, 1931.

Schoen, WILHELM EDUARD, BARON VON (1851-1933). German diplomatist. Born June 3, 1851, he entered the diplomatic service in 1877, and was minister at Copenhagen, 1900-05, at St. Petersburg, 1906, and secretary of state, foreign office, 1907-10. As ambassador to France, his conduct of

some distance above the conning tower. The lower end of one tube is attached to the air intake of the engines, drawing air from the atmosphere by an extractor fan. The end of the other tube is fixed to the engine's exhaust, carrying the exhaust gases away. The tubes make it possible for the Diesel engine to run without harm to the crew while the submarine is submerged. After the Second Great War, the *Schnörkel* became standard equipment on British submarines. See *Submarine*.

Scholar (Anglo Fr. *escoler*, modified to correspond with Lat. *scholaris*). Word used in three senses: (1) A person attending a school; (2) a student at a school or an undergraduate of a university college who is partly supported by a grant from the endowments of the school or college; (3) a person who has attained accurate knowledge, critical ability, and powers of judgement in a particular field of learning.

Scholarship. Word used principally in two senses: (1) the characteristics of the scholarly person; (2) an endowment to enable a student to pursue his studies at a school, college, or

university. During the 20th century the application of (1) has been broadened. Formerly the classical tradition was so strong that Latin and Greek were the basis of any pretension to scholarship; now claims may rest on attainments in many other branches of learning.

The provision of scholarships to schools, colleges, and universities has been greatly extended. Medieval founders of colleges at Oxford and Cambridge invariably endowed them to enable "poor and needy scholars" to study there; some colleges have been richly endowed subsequently, or have gained wealth through the appreciation of their original endowments. Most of the older public schools were endowed with scholarships, but competition for them was so keen that the attainment of an "open scholarship" denoted excellence. Scholarships are liberally provided out of government funds by the ministry of Education or the ministry in cooperation with local authorities. The tendency is, however, to substitute the term "free place" or "maintenance grant" for the former word.

Large companies, benevolent trusts (e.g. Rockefeller Foundation, Nuffield Trust, Carnegie Trust), and individual benefactors, have bestowed on universities or colleges post-graduate scholarships to promote research, particularly in medicine, sociology, and technology. Cecil Rhodes founded a system of scholarships at Oxford for students from U.S.A., Germany, and British dominions and colonies. Another famous series of scholarships and exhibitions was founded by Sir Joseph Whitworth for the encouragement of engineering. See Bursar; Demy; Exhibition; Rhodes Trust; University.

Scholasticism (Gr. *scholastikos*, one who devotes his leisure to learning). The doctrines of the scholastics or schoolmen, the philosophical and religious teachers of the Middle Ages. They were so called because originally they taught the "seven liberal arts" in the monastic schools founded by Charlemagne. The history of scholasticism may be divided into two main periods, extending from the 9th century to the time of the Reformation. During the first period (9th to 12th century), its activity was at first devoted to the reconciliation of the claims of faith and reason, philosophy was pressed into the service of theology. The close study and analysis of the language of the classical writers and the fathers of

the Church led to an inquiry into the nature of the different elements of which language was composed; this resulted in the strife between Nominalism and Realism.

In the second period, acquaintance with the Aristotelian writings through Latin and Arabic translations introduced a new epoch. Metaphysics took its place as the equal, if not the superior, of religious dogma. But the abuse of dialectics and idle discussions on haecceity (thisness) and quiddity (whatness) and other unprofitable subjects led on the one hand to mysticism, on the other to the study of natural science. The old struggle between Nominalism and Realism (Scotists and Thomists), and the progress of science gradually brought about the downfall of scholasticism, although it held its ground in the Jesuit schools at the end of the 16th century. Amongst its chief representatives were Scotus Erigena, Anselm, Abelard, John of Salisbury, Albertus Magnus, Thomas Aquinas, Duns Scotus, Bonaventura, and Ockham. Interest in scholasticism has lately revived, and there is no doubt that, notwithstanding its pedantry, its lack of independent thought, and its subordination to theology, it deserves to be less harshly judged than is usually the case. In the words of Leibniz: "There is gold hidden even in the dunghap of scholasticism." See Nominalism; Realism.

Scholes, PERCY ALFRED (b. 1877). British music critic. Born at Leeds, he founded and edited the



Percy Scholes,
British music critic

Music Student (later the Music Teacher) in 1908, and was organist of the French church at Canterbury. During the First Great War he directed the music section of the Y.M.C.A., and was inspector of music in schools to London University. Associated with the B.B.C. from its foundation, he acted for some years as its music critic, having previously been music critic of *The Observer* and other journals, and was music editor of *The Radio Times*. He edited and published many histories and guides to musical appreciation, which became popular with the general public because of the way in which Scholes made the technicalities of music comprehensible. The best known of these works

was the Oxford Companion to Music. His biography of Burney won the James Tait Black prize in 1948. *Pron.* Skoles.

Scholiast (late Lat. *scholia*, marginal notes). Old term for a commentator or annotator, more especially an ancient annotator of the Greek and Roman classics.

Schomberg, FRIEDRICH HERMANN, 1ST DUKE OF (c. 1615–90). German soldier. Born at Heidelberg, he became a soldier, and during the Thirty Years' War fought for the Swedes and the French. Having been in the Dutch service, he went to France, whence he proceeded to



1st Duke of
Schomberg

Portugal to take command of an army against the Spaniards. Schomberg served France in the war that broke out in 1672 and was made a marshal, but the revocation of the edict of Nantes compelled him, a Protestant, to leave. For three years he commanded the army of the elector of Brandenburg, leaving Berlin to join William of Orange on his expedition to England in 1688. There he was made a duke and richly rewarded. As commander-in-chief he went to Ireland, where he won some successes, but was killed at the battle of the Boyne, July 1, 1690. He was buried in St. Patrick's Cathedral, Dublin. His son Charles, the 2nd duke, was killed in battle in 1693. See Boyne, Battle of the.

Schomburgk, SIR ROBERT HERMANN (1804–65). Anglo-German traveller. Born at Freyburg, in Prussian Saxony, June 5, 1804, he spent his early years in business in the U.S.A., and later travelled widely, drawing the provisional frontier between British Guiana and Venezuela and Brazil, known as the Schomburgk line, 1841–43. Knighted in 1844, he held various consular posts from 1845 to his death, March 1, 1865. He is chiefly known for his discovery of the *Victoria regia* lily. *Pron.* Shomboork.

Schönberg, ARNOLD (b. 1874). Austrian-born American composer. Born at Vienna, Sept. 13, 1874, he taught himself the elements of music, and composed chamber music and songs while at school. These works attracted the attention of von Zemlinsky whose pupil he became, and whose sister he married. He lived in

Berlin during 1901-03, and returned there in 1911, teaching at the Prussian Academy of Arts, 1923-33. The Nazi regime drove



Arnold Schönberg,
Austrian-born
American composer

Schönberg's early works included the Gurrelieder for chorus and orchestra (first performed 1913), the string sextet *Verklärte Nacht*, and a symphonic poem, *Pelleas and Melisande*. From about 1908 his music underwent a drastic change. In the first period he carried chromaticism to the limits of tonality, then dispensed with consonance and dissonance, and adopted a contrapuntal method. Later he broke away from accepted forms, and developed a new 12-note notation. In a third period he established formal principles governing the new material. His aims and methods are explained in his *Treatise on Harmony*. His pupils included Alban Berg, Egon Wellesz, and Anton von Webern, who followed the principles of "the Schönberg school." His outstanding works included the monodrama *Erwartung*, *Die glückliche Hand*; *Pierrot Lunaire*; *Friede auf Erden*; two chamber symphonies, 10 songs with orchestra, and 39 with piano. Almost all his wrote caused controversy.

Schönbrunn. Public building in Vienna, until 1918 a residence of the emperor of Austria. The first house was a hunting lodge, built by the emperor Maximilian II about 1570. This was destroyed by the Hungarians, but the emperor Matthias built another about 1618, which in its turn was destroyed by the Turks. The present building was begun by the emperor Leopold I in 1696, and was henceforward a regular residence of the emperors.

Various rulers, including Maria Theresa, made improvements and additions, including a zoological

and botanic garden. The palace contains about 1,500 rooms, and gardens of over 700 acres. The name means fine spring, there being a mineral spring here. It was occupied at one time by Napoleon, and in it his son the duke of Reichstadt was a prisoner. After the Second Great War it was used as British army h.q. in Austria until May, 1948.

Schönfeld, EDUARD (1828-91). German astronomer. Born at Hildburghausen, Meiningen, Dec. 22, 1828, where he was educated, he studied astronomy at Bonn. He was largely responsible there for the preparation of the *Durchmusterung* (catalogue) of the northern skies. He became director of Mannheim observatory, 1859, where he made a study of variable stars and nebulae. He was appointed director of Bonn observatory, 1875, where he eventually completed a star catalogue containing the places of nearly 150,000 stars. He died May 1, 1891.

Schongauer, MARTIN (1446-91). German painter, engraver, and goldsmith. Born at Colmar, he worked after 1488 at Breisach. The museum at Colmar contains the best of his religious compositions, but he is far better known by his engravings, technically the most accomplished works of his age. The British Museum owns a fine collection of these. He died Feb. 2, 1491.

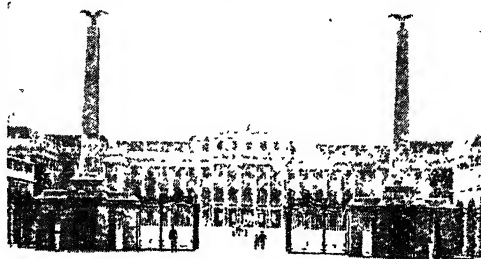
School (Gr. *scholē*, leisure, place of philosophical discussion). In some form, the school has been part of the social organization of every community. Usually the school has developed first in relation to the maintenance of the priesthood and the Church or with the royal household, the exchequer, and the administration of the state. Throughout its evolution it has been strongly influenced by vocational considerations, that is, by what their elders think the young

should be taught to prepare them for their position in life. For the Greeks the school was a place where some of the boys might have the time and opportunity to let knowledge and reflection sink into the mind and permeate the whole life; but the early Greeks did little to organize schools in the modern sense. The Greeks of Alexandria, however, had schools which became the model for the Roman schools and, through them, the prototype of the medieval grammar schools of Europe. Their curriculum covered grammar (including literature), poetry, history, philosophy, and rhetoric or oratory, to which great importance was attached by the Romans.

With the decline of the Roman Empire schools became almost wholly the concern of the Church, and the pagan Greek culture was lost. Monasteries maintained schools for the instruction of novices; numerous chantry schools were endowed, in which poor children were taught and masses were sung for the souls of the founders.

SCHOOLS IN ENGLAND. Grammar schools, privately endowed and attended principally by the sons of nobles and freemen, were set up in medieval times in charge of the secular clergy, who sometimes gave instruction in reading and writing to the local children, particularly to choristers. Some grammar schools were really local schools founded to supply scholars to the university: e.g., Winchester College, to feed New College, Oxford. The Reformation brought the suppression of the chantry schools and many monastic schools, as well as the foundation of numerous grammar schools. For several centuries these offered to their pupils a very narrow curriculum, with Latin as its core, and sometimes as the only subject. Some of the schools attracted pupils from various parts of the country, and became known as public schools; the majority remained local in their appeal. Towards the end of the 17th century a number of non-conformist schools were founded. Increasingly the grammar schools failed to meet the changing needs of a growing industrial and commercial community, and in the 18th century numerous private schools were started offering a wider and more flexible range of instruction.

There was, however, no general provision for even elementary



Schönbrunn, Vienna. Main gateway and façade of the palace, formerly a residence of the emperors of Austria

instruction of the children of the labouring classes, and illiteracy was general. The first step towards compulsory education was the requirement in the Factory Act, 1802, that employers in cotton and other mills and factories should provide between 6 a.m. and 9 p.m. adequate instruction in reading, writing, and arithmetic during the first four years of apprenticeship (of poor law children). This provision was not fully observed; some employers furnished such instruction in Sunday schools. There were also various primary schools supported by voluntary contributions and by fees.

Origins of Primary Schools

Primary education in England was developed during the first half of the 19th century principally by two great educational organizations, the British and Foreign School society founded in 1808, and the National Society for promoting the education of the poor in the principles of the established Church (1811). Their schools were called respectively British schools and National schools. The former were undenominational. The early development of these schools was influenced by the "schools of industry," a type of charity school that "mixed labour with learning" and that had originated in the 17th century. In addition to the "three Rs," the curriculum included such activities as cobbling, tailoring, gardening and agriculture for the boys, and spinning, sewing, knitting, lace-making, and baking for the girls. Some of these schools, and some of the Wesleyan schools founded in great numbers from 1843, were very successful.

In 1862 government grants became payable, based on the attendance of children up to 12 years of age. Under the Elementary Education Act of 1870, district school boards were set up over the whole country. The boards had the duty of seeing that there was sufficient accommodation in public elementary schools for all children not otherwise provided for educationally; this necessitated the building of many public elementary schools to supplement the voluntary schools. In 1875 the payment of grants was much extended, and in the last two decades of the 19th century a new type of school, the higher grade, was developed, particularly in urban districts. This served older and abler children who could remain at school

until 15 or 16 years of age, and follow an organized course of science or art training.

In 1900 the board of Education which had been set up in 1899, established a new system of higher elementary schools for children between the ages of 10 and 15; these had a curriculum which included science, one foreign language, elementary mathematics, and drawing. By the Education Act, 1902, many of these schools were converted into county secondary schools. In 1911 the L.C.C. introduced central schools, providing secondary education with a slight commercial or industrial bias; later, central schools became general throughout the country. Various day trade schools were established from 1900 onwards; and in 1913 the board introduced junior technical schools which provided full-time courses for boys and girls for two or three years after they had completed their courses at public elementary schools; continued general education was combined with definite preparation for some industrial employment at 15 or 16. The Education Act, 1918, introduced the day continuation school, in which adolescents who are employed can continue general and physical education, and if desired receive some vocational training, during day periods in which they are freed by their employers.

Education from Cradle to Grave

The Education Act, 1944, treats education as a "continuous process from the cradle to the grave." It divides the process into three progressive stages: primary, secondary, and further education. Schools are accordingly classified as primary schools (for pupils up to 11+), secondary schools (from 11+ to 18+), and institutions or colleges of further education. In addition the Act provides for the setting up of nursery schools for children between two and five years of age; special schools (*v.i.*) for pupils requiring special educational treatment; and county colleges, where young persons not attending any school or other educational institution full-time can receive "such further education, physical, practical, and vocational training, as will enable them to develop their various aptitudes and capacities, and will prepare them for the responsibilities of citizenship." The Act requires that, eventually, employed adolescents under 18 years of age should be released by their employers to attend county colleges for the

equivalent of one day a week, unless acceptable alternative provision were made by their employers. (*See* County College; Grammar School; Modern School; Public School; Technical Education; *consult also* Guide to the Educational System of England and Wales, H.M.S.O., 1945.)

APPROVED SCHOOLS. The name adopted officially under the Children and Young Persons Act, 1933, for the institutions formerly called industrial schools and reformatories. (*See* Reformatory.)

SPECIAL SCHOOLS. The Education Act, 1944, made provision for the care of children who, by reason of physical or mental handicap, are obliged for educational reasons to live elsewhere than in their own homes. Local authorities were made responsible for ascertaining the number of such children in their area, and instituting special educational treatment for them. Blind, deaf, physically handicapped, epileptic, and aphasic children require special schools, which for blind and epileptic children must be boarding schools. Other handicapped children may be educated in ordinary schools, if certain prescribed conditions are fulfilled. Attendance at special schools is from 5 to 16 years of age.

Special schools are under the supervision and inspection of the ministry of Education. Local authorities provide accommodation for some 6,500 children, voluntary societies for some 8,000. Some handicapped children (*e.g.* those who are tubercular or crippled) are accommodated for long periods in ordinary hospitals.

More than 7,500 mentally defective children are cared for in institutions. The educational authorities are responsible for those who are educable; the others are dealt with under the Mental Deficiency Acts.

School Board. Body of men and women appointed in Great Britain, under the Act of 1870, to provide and supervise elementary education. School boards were constituted for all large towns and other populous areas, the members being elected by the ratepayers every three years. They were empowered to levy a rate. These bodies continued in existence in England until 1902, when the county and borough councils took over their duties, and in Scotland until 1918.

School for Scandal. THE FIVE-act comedy by Richard Brinsley Sheridan (*q.v.*), produced at Drury

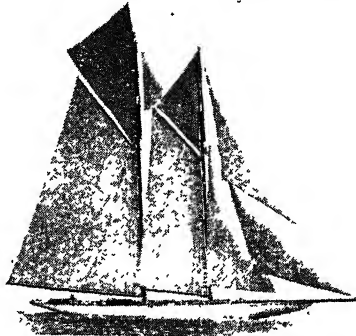
Lane Theatre, May 8, 1777. Compacted of two short dramatic pieces, *The Slanderers* and *The Teazles*, on which Sheridan had been working for some time, it was an instant and brilliant success, and has been long regarded as the supreme standard comedy of English social manners and of witty dialogue. The contrasting characters are finely individualised and some of them, e.g. Charles and Joseph Surface, have come to be regarded as typical figures of their day. The play has been many times revived, noteworthy modern productions being at the Old Vic, 1933 (Malcolm Keen, Roger Livesey, Peggy Ashcroft); the Queen's, 1937 (John Gielgud, Michael Redgrave, Peggy Ashcroft, Leon Quartermaine); the New, 1949 (Sir Laurence Olivier, Vivien Leigh).

Schoolmaster, *THE*. Treatise on education, by Roger Ascham. It was published in 1570, two years after his death. Written at the suggestion of Sir Richard Sackville, the little treatise is sensible, practical, and an early example of masterly English prose.

Schools of Art. Institutions for technical training in the fine and applied arts. Establishments of the kind have existed in Italy since the early Renaissance. The oldest extant foundation in N. Europe is the *École des Beaux Arts*, Paris, organized by Mazarin as a state institution in 1648 and at first confined to painting and sculpture. In England, Kneller founded a school of design in 1711. It was followed by William Shipley's Academy in St. Martin's Lane, and later by the schools of the Royal Academy, 1768. Foulis's Academy, 1753, and the Trustees' Academy, 1760, were the Scottish products of the same period.

In 1837 a national art training school was opened at S. Kensington to provide training in design with a view to improving design in British manufactures and raising the level of taste throughout the country, by the training of teachers of design and of suitable industrial apprentices. The school was administered first by the Science and Art dept., then directly by the board (later ministry) of education. Throughout the next 60 years most of the art teachers in local art classes

held certificates awarded by S. Kensington. Regular art classes and smaller schools of art within the S. Kensington system sprang up all over the country, usually more or less related to the requirements of design in local industries. Some of these achieved notable success at different periods, especially those in the larger centres, e.g. Manchester, Leeds, Birmingham, and various L.C.C. schools of art, e.g. Central School; Camberwell. In 1901 the art school at S. Kensington was re-organized as the Royal College of Art. The training of teachers was to some extent decentralised, but students at the college itself could be awarded a diploma of associateship (A.R.C.A., Lond.), which ranked as the highest qualification for an art teacher. Associates are entitled to wear gown and hood, the latter lined with crimson brocaded silk. The emphasis in training was still upon the production of qualified teachers, to staff not only the local schools of art but secondary and grammar schools. The college gave advanced training, primarily in all branches of applied design but also in architecture, painting,



Schooner. Racing schooner under full sail

sculpture, and etching. After the First Great War, the fine arts received more attention than before, especially as the diploma of associateship was from 1921 awarded for success in one branch only, e.g. painting, possibly at the expense of design; and the college became more widely divorced from any true relation with industrial requirements. In 1948 the syllabus was again completely reorganized so as to remedy this. A licentiateship was introduced as the "standard" diploma for students, the associateship being reserved for those who demonstrate in the industrial field the practical value of their training.

From 1949 the college was administered under trust by a council, instead of directly by the ministry of education.

The Royal Academy schools and the Slade School (*q.v.*) remain the leading British institutions for training in the fine arts. The principal centre of training in Scotland is the Edinburgh College of Art.

Schools of Music. Institutions for the training of musicians. The oldest in Europe is the Paris Conservatoire (1784). Others with long histories include those of Prague (1811), Brussels (1813), Vienna (1817), Leipzig, founded by Mendelssohn (1843).

The oldest British equivalent is the Royal Academy of Music (1822). The Royal College of Music was founded as the National Training School of Music in 1873, and the City of London's own institution, the Guildhall School of Music, dates from 1880. The principal schools outside London include the Royal Manchester College of Music, and the Scottish National Academy of Music, Glasgow. In the U.S.A., Canada, and Australia, the best schools of music are usually associated with universities. See *Music*, Guildhall School of; *Music*, Royal Academy of; *Music*, Royal College of.

Schooner (Scott. *ecoon*, to skim). Type of sailing vessel. Schooners may have any number of masts from two to six; there are also schooner yachts. Two-masted merchant schooners are likewise called topsail schooners, because they have square topsails on the foremast. Four-masted schooners are fore and aft rigged throughout, and sail very quickly. Schooner yachts are usually fore and aft rigged on both masts.

Schopenhauer, ARTHUR (1788-1860). German philosopher, the apostle of pessimism. He was born at Danzig, Feb. 22, 1788, his father being a banker, his mother a well-known novelist. After studying at Göttingen and Berlin, he graduated at Jena in 1813. He passed the next winter at Weimar, with Goethe, later travelled in Italy, and in 1820 became lecturer at Berlin university. Failure as a teacher and the outbreak of cholera in 1831 caused him to remove to Frankfurt-on-Main, where he lived in private until his death, Sept. 21, 1860.



Arthur Schopenhauer. German philosopher. Sept. 21, 1860.

Schopenhauer's chief work, *The World as Will and Idea*, 1819, starts with the proposition that the world is only an intellectual phenomenon, objective only in reference to the knowing subject. We do not see the world as it is in reality, but only through the subjective forms of space and time. What, then, is the real thing, the thing-in-itself? Self-examination shows us ourselves as bodies in space and as will-exercising beings. Behind the world as *Idea* rises the *World as Will*, the only true external Being. But *Will*, though real, is unreasoning, originating in desire and discontent. Life is continual suffering. Pleasure is merely negative, absence or respite from pain; pain alone is positive. Is there no relief? Art, especially music, and a moral life based on sympathy, are palliatives, but will not end suffering. The only hope lies in the destruction by asceticism of the will to live. and, if this fails, retirement from the world into Nirvana. *Pron.* sho-pen-how-er. *See* Pessimism.

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Schorl. Black variety of tourmaline (*q.v.*). Schorl rock is a quartz-schorl rock resulting from the tourmalinisation of graphite. *Pron.* shorl.

Schottische (Ger., Scottish). Once popular dance for the ballroom, somewhat like the polka, though the tempo was slower. The music was in 2-4 time. *Pron.* shot-teesh.

Schreckhorn. Peak of the Bernese Oberland, Switzerland, E. of the Grindelwald with alt. 13,386 ft. The ascent was first accomplished in 1861 by (Sir) Leslie Stephen; that of the Klein Schreckhorn, 1,910 ft. lower, in 1857 by Eustace Anderson.

Schreiber, Lady CHARLOTTE ELIZABETH (1812-95). Welsh



Lady Charlotte Schreiber, Welsh scholar

scholar. Daughter of the 9th earl of Lindsay, she was born May 12, 1812, and in 1833 married Sir Josiah Guest (d 1852) and in 1855, Charles Schreiber. During

1838-49 she issued a 3-vol. version of the medieval Welsh tales, commonly known as *The Mabinogion*, which marked an epoch in the study of Celtic literature, and was translated into French and German. She also did much to revive the Welsh Eisteddfod. She died Jan. 15, 1895.

Schreiner, OLIVE (Mrs. Cronwright-Schreiner) (1862-1920). A South African novelist. She was



Olive Schreiner, S. African novelist Elliott & Fry

born in Basutoland, daughter of a Lutheran missionary. The Story of an African Farm, 1883, published under her pseudonym of Ralph Iron, attracted great attention. Her other stories include *Dreams*, 1891; and *Trooper Peter Halket*, 1897. In *An English South African's View of the Situation*, 1899, she upheld the Boer position. *Woman and Labour*, 1911, was a strong expression of her feminist views. She died Dec. 12, 1920. *Consult* Not Without Honour, V. Buchanan-Gould, 1949.

Schrödinger, ERWIN (b. 1887). Austrian physicist. He was born at Vienna, Aug. 12, 1887, and educated there and at several German universities. He held academic posts at Stuttgart and Breslau, but in 1933 came to England and was for five years a fellow of Magdalen College, Oxford, being joint winner of the Nobel prize for physics with P. A. M. Dirac in 1935, because of his outstanding work on the theoretical basis of wave-mechanics. He refused to accept posts in Nazi Germany, and in 1940 became professor at the Dublin institute for advanced studies.

Schubart, CHRISTIAN DANIEL (1739-91). German poet and musician. He was born at Obersontheim, Württemberg, March 24, 1739. His musical gifts obtained him the position of organist and schoolmaster at Ludwigsburg in 1769, but his indulgence in satire cost him this post, and for a time he led an unsettled life in various towns. In Augsburg he produced a political paper, *Die Deutsche Chronik*, a satire which led to his imprisonment. He was visited by Schiller in prison, and there he wrote *Der Ewige Jude* (*The Wandering Jew*), several of his best poems, *Gedichte*, 1785-86, and his *Autobiography*, 1791-93. After his release he became mana-

ger of the theatre and poet-laureate at Stuttgart, where he died Oct. 10, 1791.

Schubert, FRANZ PETER (1797-1828). Austrian composer. Born in Vienna, Jan. 31, 1797, he displayed great musical gifts as a child, and in 1808 attended the imperial school which educated choristers for the court chapel. There he studied under Salieri, and composed in 1810 his first work, a piano fantasia. He was an usher in his father's school during 1813-15, then embarked on a career as probably the most prolific composer who ever lived. He subsisted chiefly by the generosity of friends, and during his lifetime, which was spent almost wholly in Vienna, his music was little known outside a small circle of admirers. Early in 1828 he gave his only public performance of some works, but he died on Nov. 19, and was buried near Beethoven.



Long Schubert

Of Schubert's eight symphonies, No. 7 in C is one of the most inspired ever written, and No. 8 is the "Unfinished," in B minor. Both mark Schubert's intense individuality. Among chamber music, the octet reveals the beginning of the composer's mature period; it preceded the fine string quartets in A minor, D minor, and G, the string quintet in C, the grand duo, and piano sonatas. Schubert was not only the originator of the modern song (*Lied*), but its unsurpassed master. His songs, over 600, range from the simplicity of the folk-song to the height of symphonic power. Among the most celebrated are *The Erl King*, *Gretchen am Spinnrade*, *Wanderers Nachtlied*, *Der Fischer*,

Jagers Abendlied, and the song-cycles Die Schöne Müllerin. Schwanengesang, and Winterreise—masterpieces appreciated at once by students and habitués of taverns, for whom indeed many were written. Of 13 completed operas, only excerpts are now performed, like the incidental music to Rosamunde. Apart from piano works mentioned above, there are the Moments Musicaux, impromptus, and the Wanderer fantasia.

The majority of these works were almost unknown until in 1838 Schumann discovered a number of MSS. Grove and Sullivan, in 1867, brought to light seven symphonies and quantities of smaller pieces. On their discoveries the authoritative edition of Breitkopf and Härtel was based.

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Schultz Powder. The first smokeless powder, invented in 1865 by Colonel E. Schultz. It is a compound of nitrocellulose, potassium, and barium nitrates, and is still an admirable sporting powder for medium and heavy shot loads. See Smokeless Powder.

Schuman, ROBERT (b. 1886). French statesman. Born June 29, 1886, in Luxemburg, of Lorraine parents, he studied law at Bonn, Munich, and Berlin, and practised as a barrister at Metz (which he was to represent as deputy from 1919). An officer in the German army, he went over to the French in 1916, and after the First Great War helped to arrange reparation settlements. Reynaud made him under-secretary for refugees from the evacuated French provs. in 1940, and he continued in office for a few weeks under Pétain, resigning in Sept. Imprisoned by the Germans at Metz, and sent to Germany 1941, he escaped the next year and joined the resistance movement in Lyons. A leading member of M.R.P., he was twice minister of finance, 1946; and prime minister Nov., 1947–July, 1948, and for a week in Sept. Foreign minister from Oct. 28, 1949, he produced in May, 1950, a plan for international control of W. Europe's coal and steel.

Schumann, CLARA JOSEPHINE (1819–96). German pianist. Daughter of Friedrich Wieck (1785–1873),

a noted piano teacher and maker, she was born at Leipzig, Sept. 13, 1819, first played on the platform in 1828, and appeared successfully in Paris. 1832.

She married Robert Schumann in 1840, appearing in London for the first time shortly before his death, 1856, and playing there frequently between 1865–88. From 1878 she taught the piano at Frankfurt conservatoire, and had many distinguished pupils. A pianist of wide accomplishment and interests, and the close friend of Brahms, she died May 20, 1896.

Schumann, ROBERT ALEXANDER (1810–56). German composer. Born at Zwickau, Saxony, June 8, 1810, the son of a publisher, he displayed literary and musical precocity, reading widely among the Romantics while at school and later at Leipzig and Heidelberg



Clara Schumann,
German pianist



Robert Schumann

universities, where he studied music when he was supposed to be working at law. He was taught piano playing by Friedrich Wieck at Leipzig, but an injury to his right hand in 1830 cut short his career. Schumann turned to piano composition and in an essay on Chopin, 1831 first stated his ambition to create a fusion of literary and musical ideas. Papillons, 1831, he openly declared to be a musical representation of a scene in Richter's novel, Flegeljahre. Between 1834, when he began his unhappy engagement to Ernestine von Fricken, and 1840, when he married the pianist Clara Wieck, he com-

posed for the piano Études symphoniques, 1834; the famous Carnaval, 1834–35; Phantasie-stücke, 1837; Kreisleriana, 1838.

Schumann was given a doctor's degree by the university of Jena in 1840, and that year turned to songs, composing in all 150. Before 1845 he finished a masterpiece, the lovely piano concerto in A minor. He became professor in the Leipzig conservatoire in 1843, in which year he wrote Paradise and the Peri, his first attempt at combining the vocal and orchestral. He began music to Goethe's Faust in 1844 (completed in 1853), but for two years suffered from acute nervous prostration bordering on insanity. After he had recovered he composed Genoveva, his only opera, and the music to Byron's Manfred. From 1850 came chamber music, sacred music, symphonies, songs and concertos. His illness returned in 1854, when he heard continually the note A sounding in his ears. Having thrown himself on Feb. 27 into the Rhine, from which he was rescued, he was confined to an asylum near Bonn, where he died July 29, 1856.

Schumann was the leader of the early Romantic school of German composers, as Brahms was of the later. As a composer of songs he was second only to Schubert, whose music he did more than any man to introduce to the world. He showed a mastery of the introspective, the dramatic, the purely lyrical. In pieces for the piano he brought descriptive composition to a high pitch of excellence. The piano quintet, cello concerto, and fourth symphony in D minor are other notable works.

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Schurz, CARL (1829–1906). American politician. Born in Germany, March 2, 1829, he was educated at Cologne, and the university of Bonn. In 1848 he rose against the Prussian authorities and had to leave his country, settling in America in 1852. In Wisconsin he became a politician on the republican side, and, having in 1861–62 been minister to Spain, commanded a division in several battles of the Civil War. The struggle over, he returned to journalism at Detroit and then at St. Louis. He started a Liberal Republican party, but broke away in 1884, when he led the Mugwumps (q.v.), and henceforward

took an independent line. During 1877-81 he was secretary of the interior, and he stood at every presidential election until 1904. He died May 14, 1906. Schurz wrote *Life of Henry Clay*, 1889; *Essay on Lincoln*, 1891; *Reminiscences*, 1906.

Schuschnigg, Kurt von (b. 1897). Austrian statesman. He was born at Riva, S. Tirol, Dec. 14,



Kurt von Schuschnigg,
Austrian statesman

1897, and educated at Fribourg and Innsbruck university. Practising as an attorney, he became a member of the Austrian parliament in 1927, being minister of justice during 1932-34. On the assassination of Dollfuss (q.v.), Schuschnigg became chancellor and minister of defence, and of foreign affairs, holding these posts during the difficult period when Nazi pressure against Austrian independence was steadily increasing. He planned a plebiscite, to ascertain if the people wished for union with Germany, but this was forestalled by Hitler, who in March, 1938, annexed the country and imprisoned Schuschnigg. The latter was released by the Allies in 1945. In 1948 he became professor at St. Louis university. He wrote an account of his experiences in *Farewell, Austria*, Eng. trans. 1938. A study by R. K. Sheridan appeared in 1942.

Schuster, Claude Schuster, 1st Baron (b. 1869). British administrator. He was born Aug. 22, 1869, and educated at Winchester, and New College, Oxford. Called to the bar in 1895, he entered government service and held various posts in the board of Education, becoming principal assistant secretary of its legal branch in 1911. He later joined the national health insurance commission, and from 1915 to 1944 was clerk of the crown in chancery and permanent secretary to the lord chancellor. Knighted in 1913, he was raised to the peerage in 1944, in which year he became director of the legal division of the British element of the control commission for Austria, holding this post for two years. An enthusiastic mountaineer, he wrote several books on the subject, the most popular being *Days in the Alps and Pyrenees*, 1931.

Schuster, Sir Arthur R (1851-1934). British physicist. Born at Frankfort-on-Main, Sept. 12, 1851, and educated at Geneva, Owens

College, Manchester, and Heidelberg, he made a study of spectroscopy, on which he became a leading authority. He led the British expedition in 1875 to Siam to observe the solar eclipse. Professor of physics at Manchester university, 1888-1907, he carried out many important researches on the sun, earthquakes, calorimetry, radiometry, and terrestrial magnetism. He was secretary of the Royal Society, 1912-19, and president of the British Association, 1915. He was knighted, 1920, and published *Theory of Optics*, 1904, and *Britain's Heritage of Science*, 1917, the latter with Sir A. E. Shipley. He died Oct. 14, 1934.

Schuyler, Philip John (1733-1804). American soldier and statesman. He was born at Albany, New

York, Nov. 11, 1733, and his first service was with the British army, with which he fought in the war against the French and Indians at Lake George in 1755. After



P. J. Schuyler,
American soldier
After J. Trumbull

the outbreak of the War of Independence, he was appointed a major-general in the revolutionary army, but was obliged by ill-health to give up the command of an expedition he had organized against Canada. Later, he took part in the fighting against Burgoyne, but, having been exposed to continual friction and jealousy, resigned in 1779. He held several civil appointments, and became one of the Federalist leaders after the war. He died at Albany, Nov. 18, 1804.

Schwabe, Samuel Heinrich (1789-1875). German astronomer. Born Oct. 25, 1789, at Dessau, and educated at Berlin as an apothecary, he turned his attention in 1826 to astronomy. He made a special study of sunspots, and was the first man to suggest their 11 year periodicity. The importance of Schwabe's discovery was not recognized by astronomers for many years after his first announcement in 1843. He died April 11, 1875.

Schwarz, Berthold (d. c. 1380). German monk, to whom was wrongly attributed the invention of gunpowder. He was probably born at Freiburg-in-Breisgau, early in the 14th century, his name being originally Konstantin Ancklitzen, but exact facts have never been satisfactorily established. He is supposed to have disposed of his

invention of heavy artillery weapons to the Venetians in 1378, and an old tradition says that, as a punishment for his dangerous ingenuity, he was blown up with gunpowder by the emperor Wenceslas.

Schwarzburg. Ancient German family, members of which ruled until 1918 over the principalities of Schwarzburg-Rudolstadt (360 sq. m.; pop. 105,000) and Schwarzburg-Sondershausen (330 sq. m.; pop. 90,000). The name was taken from the village of Schwarzburg. They claimed descent from the Frankish kings, and were important in the 13th and 14th centuries, where one of them, Gunther, was chosen German king in opposition to Charles IV. The family possessions were subdivided to form inheritances for several sons, but in 1599 only two of these lines survived; later both counts were made princes of the empire. In 1909 the Sondershausen branch died out and the prince of Rudolstadt inherited his crown. In 1918 the two principalities, which had been notable for their health and pleasure resorts, were merged into the state of Thuringia.

Schwarzenberg, Felix Ludwig Friedrich, Prinz von (1800-52). Austrian statesman. Born at Krumau, Oct. 2, 1800, he served six years in the army and 24 in the diplomatic service, but his importance is in the fact that on Metternich's retirement in 1848 he held the empire together in the face of revolution. A pronounced reactionary, he caused the emperor Ferdinand to abdicate in favour of Francis Joseph, and restored the German diet and Austria's position of dominance therein. Schwarzenberg died in Vienna, April 5, 1852.

Schwarzenberg, Karl Philipp, Prinz von (1771-1820). Austrian soldier. Born in Vienna, April 15, 1771, he entered the army and fought against Turkey and France. Present at several of the great battles, he then helped to arrange the marriage between Marie Louise and Napoleon, a circumstance which earned for him the emperor's friendship. He led the Austrian contingent in the invasion of Russia in 1812, but was soon fighting once more against France. He commanded the Austrians at Leipzig, and his services were richly rewarded with gifts and titles. He died Oct. 15, 1820.

Schwarzhorn (Ger., black peak). Name of several peaks in Switzerland. The highest is in the Monte Rosa group, 13,882 ft. The Grindelwald S., 9,610 ft., commands

extensive views; the Flüela S., 10,335 ft., is an easy climb from the Flüela Pass; the Augstbord S., 10,512 ft., is easily ascended from the Augstbord Pass.

Schwarzwald. Forest region lying along the Rhine in Baden. It is better known in English as the Black Forest (*q.v.*).

Schweidnitz (Pol. Swidnica). Town of Silesia. It lies in the area of Germany placed in 1945 under Polish administration. It stands on the left bank of the Weistritz at the foot of the Riesengebirge, 28 m. S.W. of Wrocław. The Rathaus has a tower, built in 1548, and an oriel window, dating from 1716. The town, famous for its beer, had manufactures of cloth, linen, gloves, tobacco, and leather. Pop. (1939) 31,000.

Schweinfurt. Town of Bavaria, Germany. It stands on the Main, 50 m. N.W. of Nuremberg. The Rathaus, built 1570-72, was considered one of the best examples of the German Renaissance style. One of the oldest cities of Germany, dating from 791 or before, it became in the 20th century a centre of the ball-bearing industry. As such it was during the Second Great War frequently bombed by British and U.S. aircraft. When the U.S. 7th army captured it April 11, 1945, it was found to be virtually destroyed. Pop. 39,400.

Schweinfurth, GEORG AUGUST (1836-1925). German explorer. Born at Riga Dec. 29, 1836, and educated at Heidelberg and Berlin, he travelled in Egypt during 1864-68. He explored the oases of the Libyan desert in 1874, and his observations then led him to visit many of the oases of Arabia, of whose flora he made profound study. His explorations included the White Nile, and Barca coast. He died Sept. 19, 1925.

Schweitzer, ALBERT (b. 1875). German theologian, musician, and doctor. Born Jan. 14, 1875, at Günsbach, Alsace, he was educated at the universities of Paris, Berlin, and Strasbourg, becoming curate of the church of S. Nicolaus in the last-



Albert Schweitzer,
German theologian

named city, and later principal of the theological faculty and professor of religious philosophy at the university. A musician of international repute, from 1902 to

1912 he was organist to the Bach Society of Paris, and attained a European reputation with the publication in 1905 and 1908 of a masterly study of J. S. Bach. Other works, reflecting his extraordinarily varied interests, included *The Quest of the Historical Jesus*, 1911; *On the Edge of the Primeval Forest*, 1922; *From My African Notebook*, 1939. In 1905 he abandoned a brilliant academic career to study medicine. Having qualified as a doctor, he became a volunteer medical missionary in the Gabun prov. of French equatorial W. Africa, 1913. At Lambaréné, where he remained for the greater part of his life, he founded, equipped, and maintained a hospital, returning to Europe periodically to give organ recitals in order to raise funds. For many years he was engaged in writing a treatise on the philosophy of civilization, 2 vols. of which were published in English in 1923. *Consult* Lives, O. Kraus, Eng. trans. E. G. McCallman, 1944; G. Seaver, 1947.

Schwerin. Town of E. Germany, in the *Land* of Mecklenburg, capital of the former republic of Mecklenburg-Schwerin. It stands on the lake of Schwerin, 50 m. E. of Hamburg. The Gothic cathedral (1170-1416) had some fine stained glass and Flemish brasses. The palace is on a small isle on the site of an old Wendish fortress of the Obotrite princes. The town, founded by Henry the Lion, 1160, passed to Prussia in 1759 and was taken by the French in 1806. After the Second Great War it came within the Russian zone of occupation. Pop. 90,240.

Schwyz. A canton of Central Switzerland. It is adjacent to Lakes Zurich, Lucerne, and Zug, and contains Lake Lowerz. It is one of the three original cantons of the federation, and also one of the four forest cantons. As a result of the leading part played by Schwyz in the early history of the confederation, its name from about 1450 came into general use as the name for the country. It is largely pastoral and agricultural, its area is 351 sq. m. Pop. 65,000.

Schwyz. Town of Switzerland, capital of Schwyz canton. It lies at the foot of the Gross Mythen, 24 m. by rly. E. of Lucerne. The 16th century town hall is adorned with frescoes and has a valuable MS. library. Brunnen, on the Lake of Lucerne, is its port. Pop. est. 8,000.

Sciaccia. City of S.W. Sicily. It is in the prov., and 45 m. by road N.W., of Agrigento. The neighbouring hot springs of Monte

San Calogero (1,272 ft.) were known to the Romans as the *Thermae Selinuntinae*. Pop. 25,000.

Sciatica (Gr. *ischiadikos*, from *ischion*, hip-joint). Painful affection of the sciatic nerve. It is most frequent in adult males, particularly those who suffer from gout or rheumatism. Exposure to cold and wet is sometimes the cause. In some cases the pain is due to pressure of a tumour on the sacral nerves, or to disease of the hip-joint, and in rheumatic cases to changes in the sheaths of the muscles. The pain is felt at the back of the thigh, and in severe cases may extend down to the foot. In prolonged cases there is wasting of the muscles, and the hip-joint and knee-joint may become permanently bent. Treatment consists in attacking the basic cause and in rest and warmth. Pain is mitigated by suitable drugs, and the nerve may be temporarily put out of action by injection.

Scioli. Town of Sicily. It is 5 m. S.W. of Modica in the prov. of Syracuse, and is near the ruins of ancient Casmenae or Sciathus. Cheese and cloth are made.

Science. Systematised knowledge; truths ascertained by observation, and organized by classification, description, and definition to disclose causal relationships. Experiment is an attempt to extend and control observation. Science is theoretical knowledge. Skill in applying such knowledge may be an art or a craft. Science traces order in nature, by ascertaining what are the characteristics common to different types of things and what are the causes and consequences of those characteristics. It is concerned with the general, not with the particular, which it studies only to gain more exact knowledge of the general.

A scientific law is merely the most exact statement the scientist can give of what has been observed; any scientific law may be shown by further observation to need correction. Science has progressed principally through the correction of such laws and the recognition of relationships between laws that previously were not known to exist. Indeed, its history is strewn with laws that have been discarded as false.

Though science is a unity, it is convenient to speak of the sciences, and to attempt to group them. They are commonly classified (as suggested by Herbert Spencer and Karl Pearson) into the abstract and the concrete, which deal respectively with the mode and with

the content of perception; the concrete are further divided into biology (living things) and physics (inanimate things). The principal branches of science receive separate entries in this Encyclopedia.

Science Museum. THE. Institution in Exhibition Road, S. Kensington, London. First proposed by Albert, prince consort, after the Great Exhibition of 1851, the National Museum of Science and Technology has grown from a modest collection illustrating foods, animal products, examples of structures and building materials, and educational apparatus (opened to the public 1857) to its present fame as a centre of study in scientific and technical development of world-wide interest, with over a million visitors each year. Until 1899 the art collections and the science and engineering collections together formed the South Kensington Museum, but in that year the name was changed to the Victoria and Albert Museum, and in 1909 the Science Museum acquired its separate character and home, to which a new extension was opened 1928. Since 1948 it has been organized in seven departments: physics; chemistry and geography; land transport and communications; motive power; air and water transport; industries; astronomy and geophysics. A science library of 344,000 vols. is attached to the museum.

Scientific and Industrial Research. DEPARTMENT OF. Government agency of the U.K. In 1915 the committee of the privy council was created by order in council a body corporate, the Imperial Trust for the Encouragement of Scientific and Industrial Research, to administer funds provided for research. The dept. of scientific and industrial research (D.S.I.R.) was created Dec. 15, 1916, to serve the committee. The lord president of the council is president of the committee of the privy council, which has an advisory council of eminent scientists and a secretary who is head of the D.S.I.R.

The dept.'s research work is divided into 12 main branches, each with its own laboratory and research station, as follows: building; Garston, near Watford; chemical, Teddington; fire, Boreham Wood; food, with research stations at Cambridge (low temperature) and Aberdeen, and laboratories at East Malling and Covent Garden; forest products, Princes Risborough; fuel, Greenwich; hydraulics, London; mechanical engineering, London; pest

infestation, Slough; radio, Slough; road, Harmondsworth; water pollution, Watford. The dept. is responsible for the geological survey of Great Britain, and maintains the museum of practical geology. Much research in pure and applied science is carried out by the National Physical Laboratory (q.v.).

Applied scientific research is also undertaken on a large scale by private industrial concerns maintaining their own laboratories and staffs of scientists. Research of this kind showed a tenfold increase from 1930 to 1950; the greatest amount was done in aeronautical and automobile engineering; and next came the chemical industries.

A National Research Development Corporation was set up under the Development of Inventions Act, 1948.

Scilla. Genus of about 100 species of bulbous perennials of the family Liliaceae, popularly known as squills. Natives of the temperate regions of the Old World, they have long strap-shaped leaves, and blue or purple flowers forming a raceme on a leafless scape. There are three British species, of which the commonest is the bluebell (q.v.). The others are the sea onion (*S. verna*), found among grass on rocky coasts in spring, with intensely blue flowers; and the autumnal squill (*S. autumnalis*). The squills of the druggist are derived from the large bulbs of *Urginea scilla*, an allied plant of the Mediterranean.

Scilla OR SCIGLIO. Former seaport and town of S.W. Italy, in the prov. of Reggio di Calabria. It stands on the Strait of Messina, 17 m. N.N.E. of Reggio. It was partly destroyed by an earthquake in 1783 and almost entirely in 1908. Before then it had a pop. of 5,000 and was noted for silk and wine. The neighbouring rocky headland is associated with Scylla (q.v.).

Scilly Isles. Group of islands lying off the coast of Cornwall, England. They lie about 25 m. W.S.W. of Land's End, and have a total area of 6½ sq. m. The group consists of five inhabited islands—St. Mary's, Treco, St. Martin's, St. Agnes, Bryher—and Samson, Annett, and some 30 others. In addition, there are about 100 islets and rocks, on one of which is the lighthouse, Bishop Light. Hugh Town, the capital, is on St. Mary's, also Star Castle, an Elizabethan fortress. The inhabitants call themselves Scillonians. Pop. 1,450.

The climate is mild and equable, with mean temp. in Jan. 49° F., and the vegetation most luxuriant, semi-tropical trees and flowers growing in the open air. Many sea birds, seals, and basking sharks haunt the islands. The inhabitants are mainly employed in growing flowers and vegetables for the English market, and in fishing. The islands form part of the county of Cornwall. Steamboats sail regularly from Penzance to Hugh Town, and there is an air service from Land's End.



Scilly Isles. Map of the island group off the Cornish coast

Supposed to have been the Cassiterides, or tin islands, of the ancients, the Scillies have numerous Celtic remains. Many wrecks have occurred off the islands, notably on Oct. 22, 1707, when Sir Cloudesley Shovell and about 2,000 men met their deaths. Since 1337 the islands have belonged to the duchy of Cornwall, but were allowed by royal grant to the abbey of Tavistock and by lease from Elizabeth to Francis Godolphin. In 1835 they passed to the family of Dorrien-Smith. The duchy of Cornwall now administers all except Tresco. Legend associates the islands with Lyonesse (*q.v.*). In fiction they figure in Besant's *Armored of Lyonesse* and Quiller-Couch's *Major Vigoureux*. Consult *The Isles of Scilly*, A. and H. Gibson, 1932; *The Fortunate Islands*, E. L. Bowley, 1945; *the Scilly Isles*, G. Grigson, 1950.

Scimitar (Per. *shimshir*). Short Oriental sword of peculiar shape. Its blade, which broadens from the handle, is one-edged and much curved, the cutting edge coming to a point, while the heavy back is considerably shorter. See *Sword*.

Scintillation (Lat. *scintillare*, to sparkle). Twinkling of the stars. This is due entirely to irregularities in the earth's atmosphere and is usually conspicuous near the horizon (where the starlight traverses a great depth of air) and small overhead. Different

Scimitar. One-edged sword of Turkish pattern

strata of the atmosphere at varying temperatures and pressures refract starlight differently, concentrating it at some places at the temporary expense of others. As these strata are carried across the line of sight by the wind, the star appears alternately bright and faint. Colour changes seen when bright stars are near the horizon are due to optical interference temporarily destroying some wavelengths in the light and reinforcing others. The planets do not usually twinkle, because the different points of their disks do not keep step with one another in their scintillation; thus the total light remains practically constant.

Scioppius or **SCHOPPE**, KASPAR (1576-1649). German scholar. He was born at Neumarkt, Upper Palatinate, May 27, 1576, and studied

at Heidelberg. Becoming in 1598 a Roman Catholic, he devoted his energies to violent attacks on Protestantism and his former associates, particularly on Scaliger and James I of England in *Ecclesiasticus Auctoritatis Jacobi Regis Oppositus*, 1611. He died Nov. 19, 1649. An eminent scholar, he is credited with trying to bring about a European war by his *Classicum Belli Sacri*, 1619.

Scipio, LUCIUS CORNELIUS (c. 190 B.C.). Roman general, brother of Scipio Africanus Major. He was appointed to the command of the Roman forces sent against Antiochus, his brother Africanus accompanying him as legate, and his defeat of Antiochus at Magnesia in 190 B.C. gained for him the surname of Asiaticus. On his return to Rome, Lucius was found guilty of corruption.

Scipio, PUBLIUS CORNELIUS (d. 211 B.C.). Roman general. When Italy was invaded by Hannibal, Scipio endeavoured to check his progress, but was completely defeated at the battle of Ticinus in 218 B.C. Thereupon he proceeded to Spain, where, along with his brother Gnaeus, for the next few years he kept the Carthaginians so busy that they were unable to send reinforcements to Hannibal. The two brothers, however, were defeated in 211 by Hasdrubal.

Scipio, PUBLIUS CORNELIUS, called **SCIPIO NASICA SERAPIO** (d. 132 B.C.). Roman statesman. In 149 B.C. he was sent to Carthage to arrange the surrender of arms to the Romans, and was consul in 138. A pronounced aristocrat, he was one of the bitterest opponents of Tiberius Gracchus, whom he boasted that he had slain. This so enraged the people that he was sent by the senate on a mission to Asia, and died at Pergamum in 132.

Scipio, PUBLIUS CORNELIUS, known as **SCIPIO AFRICANUS MINOR** (c. 185-129 B.C.). Roman general and statesman, son of Lucius Aemilius Paulus, the conqueror of Macedonia, but adopted into the Scipio family. He served in Greece under his father, and later in Spain. When the third Punic War broke out in 149 B.C. he at first served in a subordinate capacity, but after his consulship in 147 was given the governorship of Africa, and he brought the war to a successful conclusion with the taking of Carthage 146. In 134 he was appointed governor of Spain, and ended the war by taking Numantia (133).

It was during his absence in Spain that Scipio's brother-in-law, Tiberius Gracchus, the reformer,

met his death, but so far from showing regret, Scipio was prominent on his return to Rome in the opposition to the commissioners appointed to carry out the agrarian reforms. This brought him great unpopularity, and one morning he was found dead in his room. Scipio was a patron of letters.

Scipio, PUBLIUS CORNELIUS, known as **SCIPIO AFRICANUS MAJOR** (237-c. 183 B.C.). Roman general.

On the outbreak of the second Punic War in 218 B.C. Scipio, young as he was, fought in the Roman armies, and so distinguished himself that in 210 he was chosen



Scipio Africanus Major, Roman general

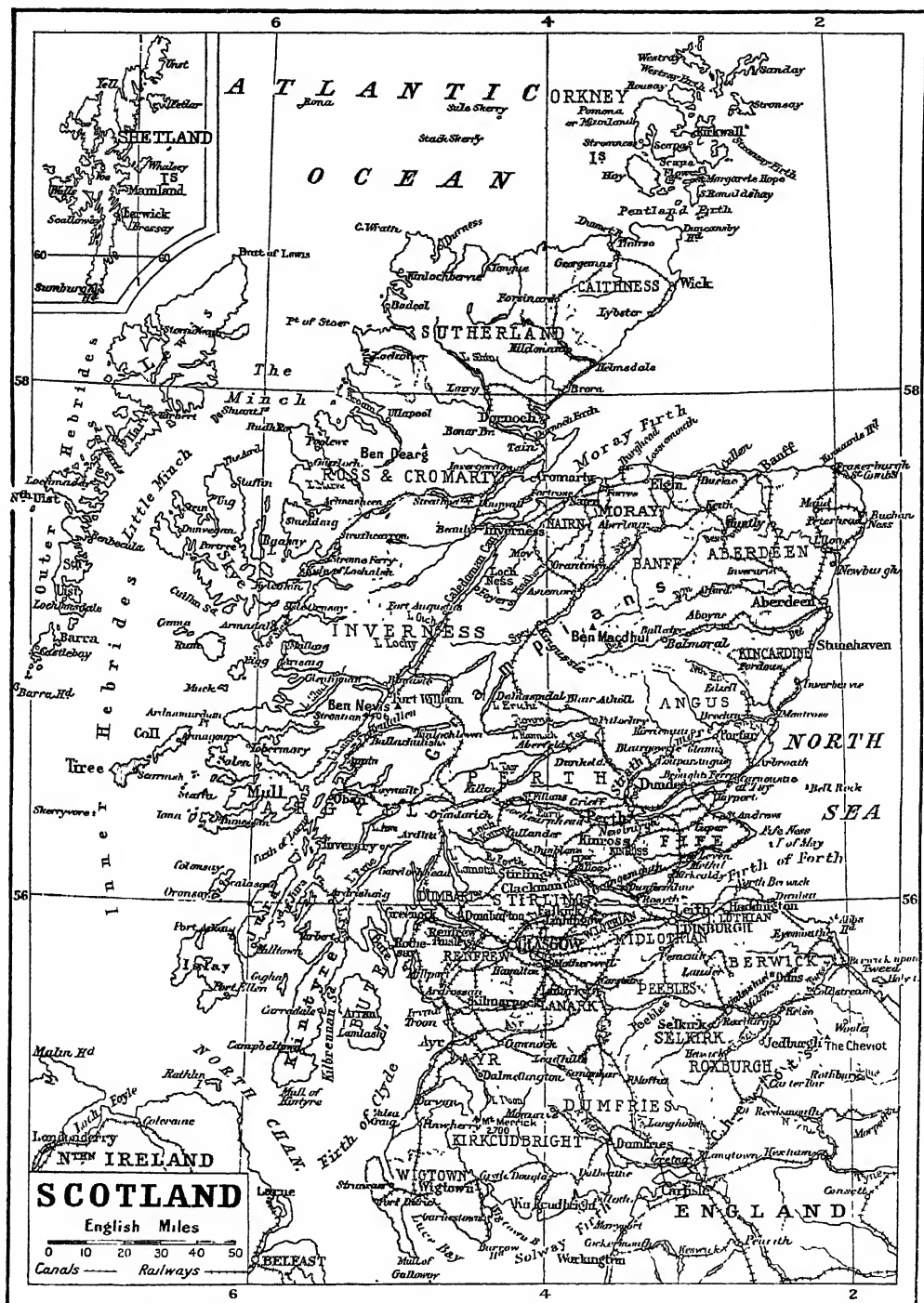
by the popular voice to take the command of the Roman army in Spain, and in three years destroyed the Carthaginian power.

Scipio, on his return to Italy in 206, urged a direct attack upon Carthage itself. The ordinary forms were set aside, and Scipio was made consul in 205, organized his forces, carried them to Africa in 204, destroyed the forces of Syphax, the great ally of the Carthaginians, and on Oct. 19, 202, met Hannibal himself and annihilated his army in the decisive battle of Zama, which ended the war and finally destroyed the Carthaginian power. For this, the greatest triumph of the Roman arms, Scipio was awarded the title of Africanus. He died at Laternum in Campania. Consult *Scipio Africanus: A Greater Than Napoleon*, B. H. Laddell Hart, 1930.

Sciron. In Greek legend, a robber who preyed upon the country on the frontier between Attica and Megaris. It was his custom to compel travellers to wash his feet, and, while they were doing so, to kick them into the sea. He was killed by Theseus.

Scirrhus (Gr. *skirros*, hard swelling). Form of cancer in which the tumour is hard and does not grow very rapidly when faced by connective or fibrous tissue. The slowness of growth is due to the fact that cancer cells produce a toxin which disintegrates the cells lying along their path; and this toxin is less effective in dissolving the cells of the harder tissues. See *Cancer*.

Scissors (Old Eng. *cissors*, from Old Fr. *cisaires*, Lat. *cisorium*). Instrument for cutting cloth, paper, etc., consisting of two blades and handles screwed or



Fuller topographical details will be found in larger-scale maps given under the headings of the various counties

To face page 7372

REFERENCE TO COLOURING

3000 Feet
2000 "
1000 "
500 "
250 "
Sea Level

50 Fathoms
100 "
500 "

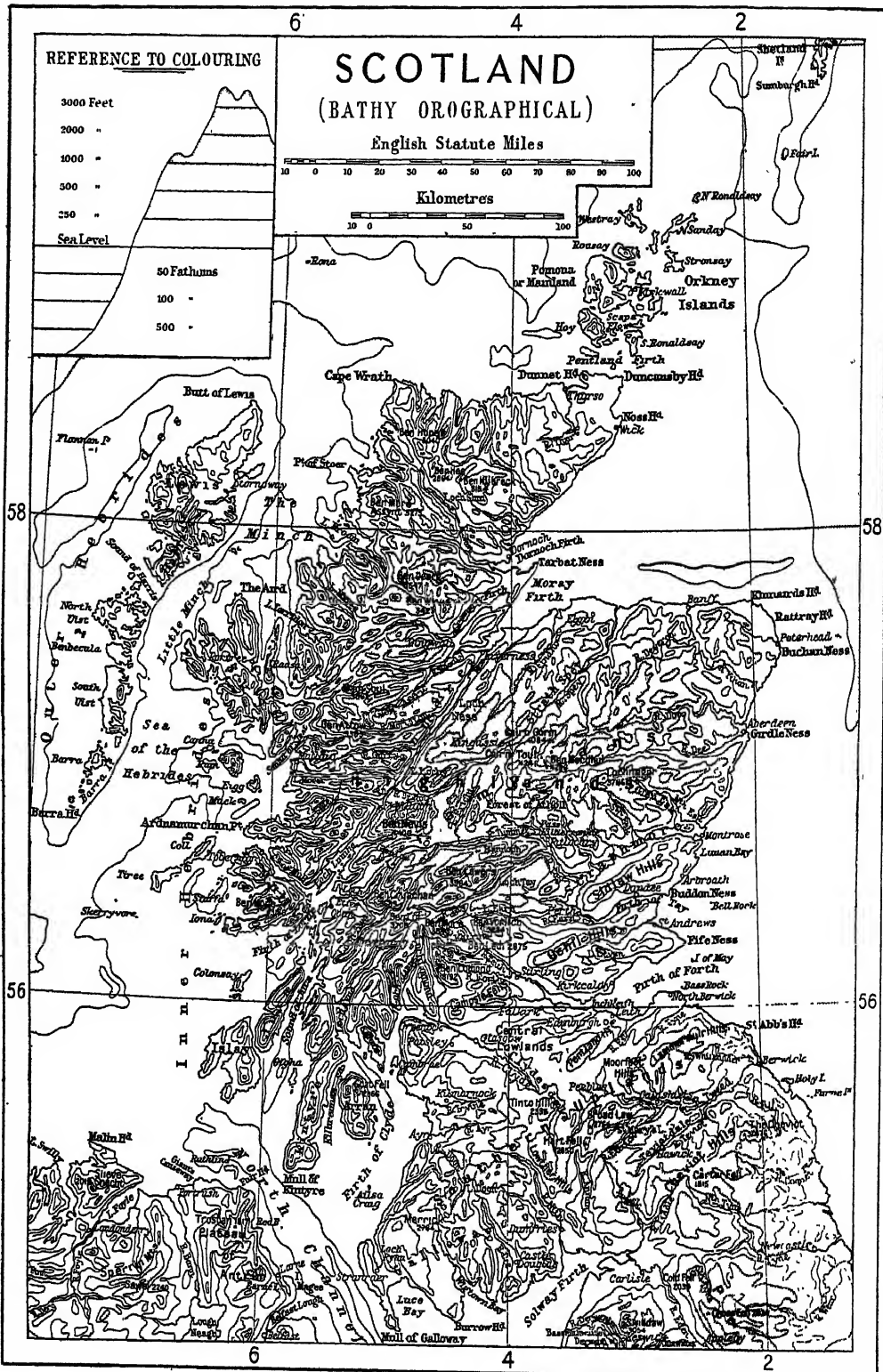
SCOTLAND (BATHY OROGRAPHICAL)

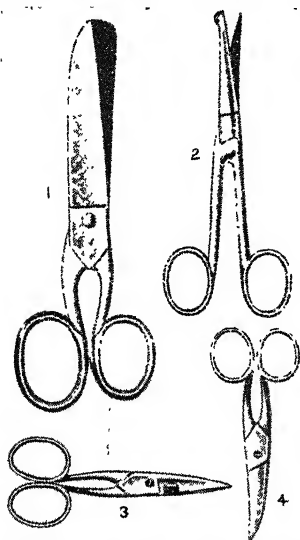
English Statute Miles

Kilometres

10 0 10 20 30 40 50 60 70 80 90 100

10 0 50 100





Scissors. 1. Tailor's scissors. 2. Surgical scissors, which take to pieces for sterilizing. 3. Button-hole scissors. 4. Curved nail scissors

riveted together, so that they open like the letter X. Each blade and handle are made from one piece of steel, the thumb or finger holes being forged. Tailor's scissors, of which there are three sorts, according to size, shears, trimmers, and cutters, have the shanks made of iron and welded to the blades. Other kinds of scissors include button-hole, with gaps in the blades so that the cut will not reach to the edge of the stuff, nail scissors, sometimes with the points bent upward, and with a file along the back, surgical scissors. Larger types are often termed shears (*q.v.*).

Scitamineae. Family of herbs, also called the plantain family. Chiefly perennials, they are natives of warm regions. The leaves are large and their stalks are usually expanded at the base so that they wrap around the stem or younger leaves. The flowers are irregular. The order includes several distinct tribes, and a number of valuable economic species, as ginger (*Zingiber*), arrowroot (*Maranta*), plantain and banana (*Musa sapientum*).

Sclerosis (Gr. *sklēros*, hard). In pathology, a hardening of a tissue. The term is usually restricted to a morbid condition of nerves followed by degeneration of nerve and loss of function, or to hardening of arteries (arteriosclerosis).

Scoliosis (Gr. *skolios*, bent). Lateral curvature of the spine. It is often due to rickets or simple weakness of the muscles and bones in rapidly growing adolescents,

especially when their habitual posture is wrong. See Spinal Column.

Scone. Cake of flour, butter, and milk, raised with carbonate of soda and cream of tartar. In Scotland barley or oatmeal is also a constituent, and the cake is baked on a griddle. *Pron.* sconn.

Scone. Parish and village of Perthshire, Scotland. Standing on the left bank of the Tay, 2 m. N.E.

of Perth, it consists of Old Scone, famous for its historical associations, and New Scone. In the 8th century Scone was the Pictish capital, and from 1153 to 1488 was the coronation place of the Scottish kings. In 1651 Charles II was crowned here. From its ancient abbey, destroyed

in 1559, the stone of destiny was carried to Westminster in 1296. The palace, begun by the earl of Gowrie, passed to the ancestors of the earl of Mansfield (*q.v.*), and was rebuilt about 1800. Pop. 2,559. See Coronation Stone. *Pron.* Scoon.

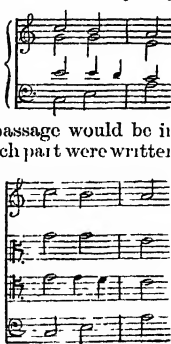
Scopas. Greek sculptor of the 4th century B.C. Born probably at Paros, he worked at Tegea, at Athens, and at other Greek cities, and in Asia Minor, where he decorated the mausoleum (*q.v.*) of Halicarnassus. With Praxiteles and Lysippus he revolutionised Greek sculpture. Several of his pieces are preserved at Athens.

Scopolamine. Another name for an alkaloid of henbane also called hyoscyine. See Henbane.

Score. In music, the simultaneous presentation of the constituent parts of a composition. They are all written on appropriate staves, so that they can be read by one person. The English name is derived from the fact that the staves are "scored" through by the barlines. A short or piano score has the parts written on two staves, as shown here

The same passage would be in open score if each part were written on a separate staff (right).

A full or orchestral score gives the parts for all the instruments each on its proper staff, except



that for those which run in pairs, such as flutes, oboes, clarinets, bassoons, etc., the parts for each pair are written on one staff. The instruments are grouped according to character, and arranged in each group according to pitch. The plan of the average full score is, beginning at the top, (a) wood wind, (b) brass, (c) percussion, (d) strings. If vocal parts are included

they are placed in the string group, between the violas and the cellos. An organ part would come lowest of all.

To score a work means (a) to orchestrate it from the piano sketch, or (b) to transcribe the separate parts so that they can be read together, a proceeding necessary for forming an

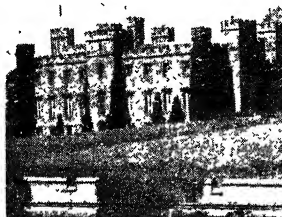
idea of the value of music which exists only in separate parts.

Scoresby, WILLIAM (1789-1857.) British explorer. The son of a whaler, he was born Oct. 5, 1789, near Whitby, and soon made voyages, being mate on his father's vessel, the Resolution, in 1806. From then until 1822 the two Scoresbys continued their voyages; in the latter year the younger made the first accurate chart of the E. coast of Greenland. In 1824 he was elected F.R.S., and next year took holy orders, becoming vicar of Bradford. He travelled to Australia in 1856 to make observations in terrestrial magnetism, and died March 21, 1857.

Scoresby Land. Portion of Greenland. It is on the E. coast N. of Scoresby Sound, and was named after William Scoresby.

Scoria (Lat., *slag*). In geology, name given to the ashy masses ejected by volcanoes. The crusts found on lava flows resembling punice in their construction are also called scoria.

Scorification. In metallurgy, a process for separating one metal from another in the molten state. When oxygen of the atmosphere combines with the molten mass, it forms a scoria or slag which can be skimmed off the top of the latter. The oxidation of lead is such a process in the manufacture



Scone, Scotland. The palace, rebuilt about 1800



William Scoresby, British explorer

of litharge. It is akin to cupellation, but differs from it in that the oxidised metal, the scoria, is removed in that state instead of being absorbed in the cupel. Silver is separated from lead by scorification, and the process is much used by the assayer. See Cupel; Lead; Silver.

Scorpion (Lat. *scorpio*). Eighth sign of the Zodiac. The claws of the constellation occupy the space called Libra by the Romans. The chief star of the constellation is Antares, a first magnitude red star. It is a double star, possessing a green companion of the seventh magnitude. There are many other double stars, a triple star in ξ Scorpii, and a quadruple in ν Scorpii. There are several well-known globular clusters containing many variables, and a nebula near Antares. The constellation has been remarkable for its new stars. See Constellation; Zodiac.

Scorpion. Order (Scorpionidae) of animals, of the class Arachnida, in the phylum Arthropoda. In general appearance they resemble a small lobster with a long, jointed tail, and are common in S. Europe and the tropics. One anterior pair of the body appendages is developed into nippers. The tail, or hinder portion of the



Scorpion from Central Africa, showing the sting at the end of the tail

abdomen, bears a venomous sting, and is usually brought forward over the back of the body, so as to threaten an enemy approaching from in front. The sting can inflict a serious wound, but it is rarely fatal to a man in good health. Scorpions lurk during the day under stones, and range at night in search of their prey, small insects and spiders. The young are brought forth alive. See Arachnida.

Scorpion-fly (*Panorpa*). Small group of insects with slender bodies, thread-like antennae, beak-like mouth-parts, and narrow mottled wings. They form the family



Scorpion-fly. *Panorpa communis*, common British species

P. communis is brown-black, measuring about 1 in. across the wings, and haunts shady hedgerows.

Scorzonera (*S. hispanica*). Perennial edible-rooted plant of the family Compositae. It was introduced in 1576 to Great Britain from S. Europe, where it grows wild. The roots are parsnip-shaped, and white fleshed, with a dark skin. Scorzonera is cultivated in the

same way as salsify (*q.v.*), except that a greater space, say 18 ins., should be allowed between the rows, and about 12 ins. between each plant. Scorzonera has a sweet, sugary flavour, and may be cooked in the same way as salsify, or boiled like other root vegetables.

Scot and Lot. Term used in England in the Middle Ages and later for the share of a tax paid by persons in chartered towns. They were assessed to scot and lot, and in certain boroughs the payment of scot and lot was a condition of the franchise. The phrase comes from an A.S. word for a payment, and lot, a share.

Scotch Corner. Junction on the Great North Road. At this point, 5 m. N. of Catterick Bridge in the N. Riding of Yorks, motorists for Scotland have a choice of taking the right fork, A1, through Newcastle-on-Tyne, or the left, A66, through Carlisle.

Scotch Mist. Term applied to the heavy drizzle associated with thick mist. It often occurs when the cloud base is adjacent to the ground, conditions most frequently encountered in hilly districts, e.g. the Scottish uplands, and the moors of Devon and Cornwall where it is known as mizzle.

Scotch Snap. In music, the name given to a rhythmical effect obtained by syncopation, and

Panorpidae of the order Mecoptera. In the male the hind end of the body can be upturned like that of a scorpion. Three species, together with the flightless *Boreus*, are British.

characteristic of the Strathspey dance.

Scotch Terrier. Small breed of rough-haired terrier. One of the hardest of the domesticated breeds, the Scotch terrier is a determined hunter, especially of vermin of all



Scotch Terrier. One of the hardest and keenest breeds of terrier

kinds, and is one of the best rat-tors. It has exceptionally large teeth for a dog of its size, and was formerly in use for hunting the fox among the rocks in the Highlands, where the going is too hard for the average foxhound. Remarkably intelligent and faithful, the Scotch terrier has always been much in favour as a companion. See Dogs, colour plate; Terrier.

Scoter (*Melanitta*). Genus of wild ducks, of which three species occur in Great Britain. The plumage is black and glossy, in some species spotted and barred with white. The common scoter (*M. nigra*) is 20 ins. long, and is numerous about the coasts of Great Britain in the winter, a few pairs still nesting in the N. of Scotland. It is marine in habit, an accomplished diver, and deep sea feeder. The velvet scoter (*M. fusca*) has a white patch behind the eye and a white bar across the wing. The surf scoter (*M. perspicillata*) is a passage migrant and winter visitant to Great Britain.



Scoter. Specimen of British wild duck

Scotists. The followers of Duns Scotus, as opposed to the Thomists, the followers of Thomas Aquinas. The Scotists were realists, who explained the existence of material things by the union of matter and form, with the co-operation of an eternal third element, which was the cause of both. See Realism.

SCOTLAND : ITS TOPOGRAPHY, HISTORY, ETC.

A. D. INNES, M.A., T. F. HENDERSON, and Others

This Encyclopedia contains articles on all the counties, cities, and other places of importance in Scotland; also on its kings, statesmen, poets, and others. See also Celt; Gaelic; Presbyterianism; and other articles on matters affecting the country. The history is continued from 1707 under United Kingdom. See also the colour maps facing pp. 7372-73, and the maps of the several counties

Scotland is the northern portion of the island of Great Britain. With an area of 30,405 sq. m.,



Royal arms

of which 609 sq. m. is covered with water, it comprises three areas, the highlands, lowlands, and southern uplands. The highlands, which make up the N.W. half of the country, consist of very old rocks, the relic of an ancient continent and related in this respect to the mountainous backbone of Scandinavia. On the average the land is about 1,500 ft. above sea level, while a number of heights rise above 4,000 ft., the culminating point being Ben Nevis, 4,406 ft. Among 186 islands are the Hebrides, Orkneys, and Shetlands groups.

Strictly there are neither mountain peaks nor mountain ranges; viewed from the glens the heights present a mountainous aspect, but seen from a height the highlands appear as smooth-contoured rounded masses of considerable extent, all of which attain almost the same level. The land is in reality an old plateau carved out by the erosive agents, ice and water. The character of the steep-sided glens; the lochs, whether long, narrow, deep lakes, or equally narrow fjords; erratic boulders, and striations on the rock surfaces, combine to indicate that N. Scotland suffered considerable destruction during the Ice Age. The Hebrides are detached fragments of the plateau, the Outer being separated from the Inner by the rift valley of the Minch. Skye, Mull, Rum, and Arran islands, and the peninsula of Ardnarmurchan are all carved out of the remnants of Tertiary volcanoes. Other islands such as Staffa and Eigg are remains of a great plateau of lava flows poured out in Tertiary times. The Northern Highlands are cut off from the Grampians by the tear-fault of Glen More, in part occupied by the long, narrow, and deep lochs Ness, Oich, and Lochy.

The Grampians present a steep face, running N.E. to S.W., to the Central Lowlands, which are bounded by a similar less con-

tinuous and less elevated scarp, where the Southern Uplands begin. These scarps mark the faults or cracks in the earth's crust at the edges of the widest of the Scottish rift valleys, i.e. the lowlands, which include the plains of the Forth, the lower Clyde, and Tay, Strathmore, and the Carse o' Gowrie, and the minor heights of the Ochil and Sidlaw hills, and the Campsie Fells. Volcanic material produced these hills, and the plains are largely of glacial drift, boulder clay, which has filled up the ancient river channels and caused a rearrangement of the river systems. The rift subsidence and the glacial overlaying have preserved within the limits of the lowlands the rocks of the Carboniferous series, with the consequence that here are the Scottish coal-fields.

Southern Uplands

The Southern Uplands have a mean height of less than 1,000 ft. and a maximum, in Mt. Merrick, of 2,700 ft. Like the highlands, they are the relics of a plateau, but while the northern heights are heather-covered moorlands, the southern are grass-covered. Their valleys also differ in being wider and less steep-sided than the northern glens, and there are neither inland lochs nor fjords. The Southern Uplands, with the Pennines of England, form a continuous elevation, the central uplands of Britain.



Scotland, S. Andrew's Cross, as the national banner

Exceptions to this three-fold division of the country are the county of Caithness, and the Orkneys and Shetlands in the far north. These areas are detached portions of the same general character as the lowlands, but they are without the coal and the climate is more insular.

Rivers differ with their location: the longest, Spey, Dec, and Tay, rise close to the highest point of the highland plateau, and are swift torrents whose valleys form the main lines of communication by road and rail. The meandering Forth is a lowland stream. Southern streams are shorter; the chief are the Tweed, Clyde, Annan, and Nith. Loch Leven is a lowland

lake, Loch Lomond is part lowland and part highland. Lochs Katrine, Erich, Rannoch, Tay, and Earn are the chief lakes of the highland glens.

The origin of the surface features has profoundly affected human occupations. The highlands are the land of the crofters. They are mainly grouse moors and deer forests, where cattle rearing and a little tillage of rough patches of reclaimed moor are the main remunerative occupations. The southern uplands are grazing land, particularly useful for sheep; in the S.E. they form the finest sheep-rearing country in the world; nowhere, except perhaps in Kent, are there so many sheep per square mile. The lowlands are the arable lands and, on the coalfields, the industrial areas.

Fertile land in Scotland is comparatively scarce, and consequently some 2,000,000 acres are devoted to deer forests, and on a great deal more sheep only are reared. On poor land, too, the crofters eke out a precarious livelihood; the same reason accounts for the fact that oats is the country's chief crop. On the rich land of the south, where is some of the most fertile in the world, wheat and barley are grown, and horses and cattle reared. Fishing has long been one of the main occupations of the Scots. An indented coast and the uninviting nature of much of the interior combined to mass the people in a long string of coastal villages, especially on the W., where they could reap the rich harvest of the sea.

Industries Old and New

If deer stalking and grouse shooting are not the fashionable pastimes they once were, angling still brings its devotees to Scotland. Mountain climbing, though not organized as in the Alps, attracts others; there are some of the world's finest golf courses; and the development of motor touring brought into being a hotel and catering industry which ended all ideas of Scotland being a preserve of the wealthy holiday-maker.

The industrial prosperity of Scotland is due to the opening of the coalfields. The great coalfield is the Lanarkshire one bearing Scotland's principal industrial area

There are also valuable mines in Fife, Ayrshire, and Midlothian. Iron ore is produced in much the same areas. Still more recent is the industry of obtaining oil from shales, carried on in West Lothian and Midlothian. Granite is quarried in the north. In the 1930s large power stations were put up in the Highlands, rivers and lochs being dammed, with a view to increasing the industrial potential of the country. (See Highland Development Scheme.)

The near presence of coal and iron, the deepening of the Clyde, and the development of trade with America have made Glasgow and neighbourhood one of the world's great industrial areas. Here are manufactures of chemicals and cottons, including sewing thread at Paisley, and engineering works. The same reasons have made the Clyde famous for its shipbuilding.

Other industrial centres are Dundee, where linen, jute, and hemp are made, and the Stirling district with its ironworks. Kirkcaldy is the centre of the sugar-refining industry. Distilling of whisky is widespread. Edinburgh is a centre of the printing and publishing trade; Perth is noted for dyeworks; there are textile industries at Dunfermline and elsewhere. The exports and imports of the country pass chiefly through the ports of Glasgow and Leith. In 1923 the railways of Scotland were amalgamated

SCOTLAND: THE 33 COUNTIES

County	Area (statute acres)	Pop. est. Dec., 1947
Aberdeen	1,261,521	332,400
Angus	559,037	278,900
Argyll	1,999,472	65,900
Ayr	724,523	321,700
Banff	403,053	52,100
Berwick	292,535	25,500
Bute	139,658	19,300
Caithness	438,833	23,500
Clackmannan	34,927	36,100
Dumbarton	157,433	156,000
Dumfries	686,302	85,800
East Lothian	170,971	50,200
Fife	322,844	299,700
Inverness	2,695,094	84,200
Kincardine	244,482	28,500
Kinross	52,410	7,900
Kirkcudbright	575,832	30,900
Lanark	562,821	1,637,500
Midlothian	234,325	581,600
Moray	304,931	45,900
Nairn	104,252	9,000
Orkney	240,847	21,900
Peebles	222,240	15,100
Perth	1,595,802	128,700
Renfrew	153,332	332,300
Ross and Cromarty	1,977,248	62,900
Roxburgh	426,028	46,200
Selkirk	170,793	22,100
Shetland	352,319	20,200
Stirling	288,842	185,900
Sutherland	1,297,914	14,400
West Lothian	76,861	86,000
Wigtown	311,984	31,800
SCOTLAND	19,070,466	5,139,600

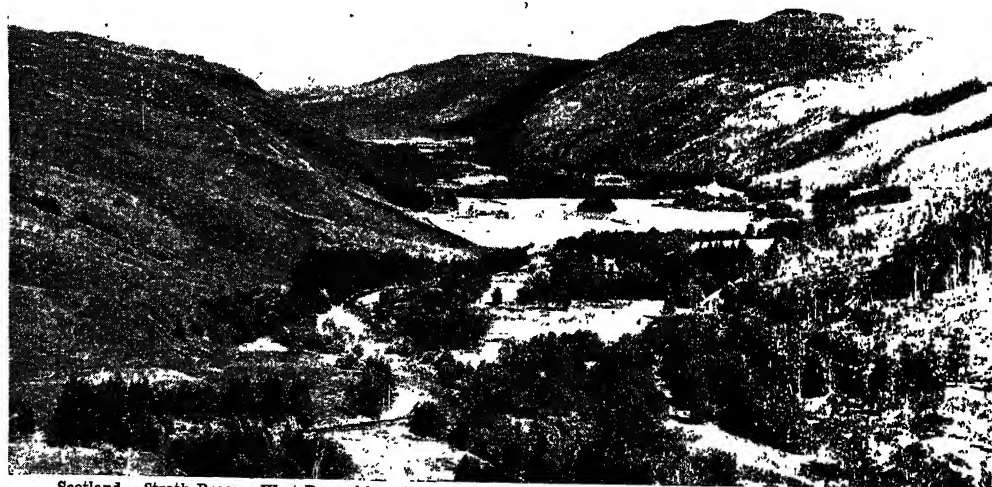
with the English companies, and the country was served by L.M.S. and L.N.E.R. until under nationalisation the Scottish Region of British Ryrs. was formed in 1948. The canals of Scotland are the Caledonian, the Crinan, the Forth and Clyde, and the Union.

The pop. of Scotland at the census of 1931 numbered 4,842,554,

more than one-fifth of whom lived in Glasgow. The return showed a slight decrease since 1921. Estimates for the end of 1947 are given in the accompanying table. There are 33 counties. Four cities which have populations in excess of 100,000—Glasgow, Edinburgh, Aberdeen, and Dundee—also rank as counties of themselves. Perhaps 10,000 persons speak Gaelic only, and 150,000 speak both English and Gaelic.

ADMINISTRATION, ETC. The union of the crowns of England and Scotland in 1603, and to a greater extent the union of the parliaments in 1707, brought about changes in the government of Scotland in the direction of bringing it under the authority of England, but in many respects the kingdom retains its own system of government. Under the Act of 1918, and up to the general election of 1945, it has been represented in the parliament of the United Kingdom by 74 members, of whom 38 represented the counties, 33 the burghs, and 3 the universities; 16 Scottish peers, elected by their fellows, sit in the house of lords. Although no longer the seat of a parliament, Edinburgh is the capital and contains the government offices.

For the general control of Scottish affairs by the government there is a secretary, who since 1926 has ranked as a secretary of state. Certain British state



Scotland. Strath Broom, West Ross-shire, characteristic of the unrivalled scenery of the north-west Highlands
Photo: R. N. Adam

departments, e.g. the Home office and board of Trade, have authority in Scotland, but for other branches of public work there are separate Scottish departments, these including education and agriculture. Revenue is collected by branches of the revenue departments, including the post office. Scotland retains its own legal system, which is quite different from that of England, although there is an appeal to the house of lords and the lord chancellor acts for all Great Britain. (*See Scots Law.*) Its ecclesiastical system, too, is quite different and distinct. (*See Church of Scotland.*) The land question has given rise to an organization of courts adapted to the peculiar needs of the country. Local government was remodelled as far as the burghs were concerned in 1835, and for the counties in 1889. The system was revised in 1929 and to a lesser extent in 1947. The burghs, which may be divided into three classes, royal, parliamentary, and police, were placed under elected councils, their constitution being made uniform, although, as in England, the larger ones have more extensive powers than the smaller ones. The various local government areas are now counties, counties of cities, large burghs, and small burghs. Each county has a council elected every three years. Each burgh has a town council, the councillors also being elected for three years, but one-third of them annually retiring. The area of each county council is divided into districts each with its council. Councillors who represent the electoral divisions in the district are *ex officio* members of the district council, but others are elected.

HISTORY. In 55 B.C., broadly speaking, the whole island of Britain was under the domination of Celtic tribes, belonging to one of two great divisions, the Brythonic from the Channel to the Firth of Forth and Clydemouth, and the Goidelic or Gaelic beyond that line. A little later we find the name of Picts applied to the northern tribes and to the people of Galloway; it is still disputed whether the Picts were Gaels or Brythons, and possibly they were an earlier indigenous people.

The division of the whole island of Great Britain into the N. and S. portions corresponding to what we now call Scotland and England dates from the Roman occupation (ending A.D. 410), which was effective only as far as Hadrian's Wall, although Roman armies marched

over Scotland and planted their garrisons and fortified walls as far N. as the Forth. By the end of the 6th century the chaos which followed the Roman withdrawal was beginning to subside, and N. of the Humber and the Dee we have in effect a division into four kingdoms, the old Celtic Strathclyde on the W., the new English Northumbria from Humber to Forth on the E., the Celtic Scottish kingdom of Dalriada—roughly Argyllshire—and the Pictish kingdom covering the rest of Scotland beyond the Forth. The Scots were Gaelic Celts from Ireland who had established themselves in their corner during the preceding two centuries.

Formation of the Kingdom

During the 7th and 8th centuries the Angles dominated the E. lowlands and perhaps the E. coastal districts beyond the Forth, but there was no disappearance of the Celtic population, and in the W. lowlands the Celtic element predominated. The N. was Christianised by S. Columba and other Irish missionaries of the Celtic Church, which in the eyes of Rome was unorthodox. The Solway-to-Tyne division reasserted itself. Northern Strathclyde was parted from southern Cumbria, and northern Bernicia (Forth to Tyne) from southern Deira, though Bernicia was counted English.

Then during the 9th century Kenneth MacAlpin, half Scot and half Pict, became the king both of the Pictish and of the Scottish kingdom; everything beyond the Clyde and the Forth became the kingdom of Scotland or Alban. Strathclyde remained independent, and at the same time there began the period of the raiding and settlement of Northmen, who dominated the English part of Scotland. The Northmen also swept down the W. coast, making settlements on the islands.

For some two centuries the two sons of Kenneth and their offspring ruled Scotland, the two houses alternating. They acquired an uncertain dominion over Strathclyde, and periodically one or another of them did homage to one or another of the English kings, a homage which may or may not have implied recognition of a general sovereignty, but certainly did not imply any general submission. During the early 11th century, when Canute was king of England, Malcolm II wrested Bernicia (Lothian) from its English or Danish earl, and annexed it to his own kingdom,

with the result that from this time it tended to attract to itself the seat of government, to acquire a political predominance, and to be what the English meant by Scotland, though to the Gaels it still remained Sassenach or Saxon.

A turning point came a few years later. Malcolm II tried to establish his own line permanently; his grandson Duncan, having succeeded to the throne, was killed in 1040 by Macbeth, stepfather and guardian of the infant claimant of the rival house. In 1057 Macbeth was overthrown by Malcolm Canmore, son of Duncan. With Malcolm's accession, the dynasty was permanently established, though trouble was made periodically by claimants of the other house, who habitually appeared as champions of Celtic against English Scotland.

Though Malcolm was a Celt on the father's side, his mother was a Dane, a daughter of Earl Siward of Northumbria; also during the reign of Macbeth he had been bred among the Anglo-Danes of Northumbria, and, after his first marriage, he took to wife Margaret, the sister of Edgar Atheling, the representative of the house of Alfred the Great. The Scots kings from his time for another 200 years held estates in England, and now and then paid homage to the Norman or Plantagenet kings, for their crown according to the English chronicles, for their English estates according to the Scots.

English and Celtic Elements

With Malcolm and Margaret the process of Anglicising southern Scotland definitely set in. The third of his sons who wore the Scottish crown, David I, carried the process further and Normanised the country, giving great estates to Norman barons from over the border. Still both the new baronage and the Church, which Margaret's influence had Anglicised, intended to retain their independence of all claims to authority secular or ecclesiastical on the part of England. Scottish institutions developed independently.

The general result of these conditions was that there were really two Scotlands, the English-speaking feudalised lowlands and the Gaelic-speaking Celtic highlands, with a fringe extending over Caithness and the Isles, where there was a large Viking element, and the descendants of Somorled Lord of the Isles professed allegiance to the king of Scotland, or the king of Norway, or to neither. The extent of the crown's authority depended

mainly on the strength of arm of the king for the time being. Scotland, however, prospered under a series of princes, most of whom were men of ability and character, who evaded both open rupture with England and definite recognition of the suzerainty claimed by English kings. The one exception was William the Lion, who raided England in the reign of Henry II, was taken prisoner, and compelled formally to do homage for his crown in 1174, in order to recover his liberty. This treaty of Falaise, however, was abrogated 15 years later, at a price, by Richard Coeur de Lion. The last Celtic claimant to the throne of Scotland was suppressed under William, and the pretensions of the king of Norway were finally withdrawn after the battle of Largs in 1263, in the reign of Alexander III, under whom Scotland attained the zenith of her early prosperity.

The death of Alexander III in 1286 was the beginning of troubles, for he left no sons; his heiress was his daughter's daughter, the child Margaret called the Maid of Norway; nor was there anyone else living who could claim to be descended from a king of Scotland later than David I, who had died in 1153. Moreover, there was reigning in England an able king, Edward I, whose statesmanship aimed at forming the whole island into one consolidated kingdom.

Intervention of Edward I

A simple solution suggested itself to him in the project of marrying his own heir to the Maid of Norway; thus the crowns would have been united, and Edward's great work as a constitution builder in England would have extended its benefits to Scotland in the natural course. But the little queen died in the Orkneys on her way from Norway in 1290, and straightway a dozen different claims to the succession were brought forward. Edward bided his time. The law of succession was undefined; the Scots barons and prelates invited the king of England to arbitrate between the claimants; and Edward, having an armed force ready to throw across the border, announced his readiness to deliver judgement on condition that the assembled barons and prelates in general and the claimants individually should acknowledge his overlordship.

The claim was formally acknowledged, and after due inquiry Edward gave judgement in favour of John Baliol, in priority to Robert Bruce, both of whom descended from David I. But when it became apparent that Edward

intended to assert his sovereignty in actual practice and to treat Baliol as though he were really his vassal, barons and prelates were no longer acquiescent. Baliol treated Edward's sovereignty as a dead letter; whereupon Edward marched into Scotland, deposed Baliol as a recalcitrant vassal, declared the crown of Scotland forfeit under feudal law, assumed it himself, and set up an administration of his own, in 1296. The climax in Baliol's offences had been his entry upon a treaty with France.

Now in all these arrangements the people of Scotland had not been consulted. The national council, which had assumed authority when there was no king to act, was an assemblage of lay and clerical magnates, among whom the lesser folk, men of small estates, tenants of the crown, and free burghers, had no voice. When Edward covered Scotland with garrisons, a soldiery who treated the population at large as a conquered people, the spirit of resistance was aroused, and, while the great barons hung back, found its leaders among the gentry, who had neither paid nor promised allegiance to Edward. Andrew Moray in the N. and William Wallace in the S. gathered in moorland and mountain fastnesses bands of valiant freemen who would not bow to the new tyranny; the strength of the resistance was demonstrated when Wallace's company shattered the chivalry of the English governor at Stirling Bridge, Sept. 11, 1297.

Wallace's success brought Edward back in person, and, by the combination of archery and cavalry, he shattered the ranks of the Scottish spearmen at Falkirk, July 22, 1298. Without active support from the nobles Wallace could not maintain an effective resistance, although Edward could not compel a consistent submission. In 1305 Wallace was betrayed into the hands of the English authorities; the champion of liberty was hanged, drawn, and quartered as a traitor.

Bruce becomes King

But Wallace was hardly dead when a new champion arose in the person of Robert Bruce (q.v.). In 1306 Bruce committed himself by the sacrilegious murder of John Comyn in the church of Dumfries. His own life being forfeit, he promptly made up his mind to fight for his own life, for the vacant throne of Scotland, and for national liberty. Supported by a handful of patriots, he was crowned king of Scotland at Scone. His little following was dispersed at the fight of Methven, but early in 1307 he surprised the English in

his own earldom of Carriok, from which he expelled them.

Edward marched north to crush resistance once for all; but died before he could cross the border, and his degenerate son Edward II broke up the army and left the subjugation of Scotland to subordinates. While he for the next six years was quarrelling with his baronage, the Scots nobles were gathering to the standard of King Robert, who, with his captains Douglas and Randolph, conducted a war of surprises, capturing one English stronghold after another till in 1314 Stirling alone was left. Then Edward gathered the mighty army which on June 24 met at the hands of Bruce with defeat at Bannockburn. A year before the great liberator's death in 1329, Scotland's independence was formally acknowledged by the treaty of Northampton.

Feudalism and the Crown

Between the death of Robert Bruce in 1329 and the accession of Charles I in 1625 all but two out of the ten monarchs who wore the Scottish crown were children at the date of their accession, unless we except also James IV, who was in his 16th year. The two exceptions were Robert II and Robert III, both of whom were over 50. Therein lies the key to the fact that a strong central government was never established; every minority was a period of strife for ascendancy between factions of the nobility. Scotland was a prey to the feudalism which in England was habitually kept down, partly by strong kings and partly by parliamentary institutions.

Of the few strong kings in Scotland, none lived long enough to establish a royal supremacy capable of surviving through his successor's minority, and parliamentary institutions were embryonic. In England they developed primarily from the need of a heavy national expenditure which the king could not meet out of his own resources, so that he had to appeal to parliament for money; whereas in Scotland the king could live "of his own." The disintegrating force of feudalism in the S., and the clan system in the N., prevented the unification of Scotland and kept the magnates virtually independent of effective control. The natural effect would have been the absorption of Scotland by her more powerful and far wealthier southern neighbour, from which some of the magnates were from time to time by no means averse, but for the fact that the people, as distinguished from the magnates, preserved an enduring hatred of

the idea of English rule; so that threats of English invasions and renewals of English claims to suzerainty were invariably defied.

Robert Bruce was succeeded by an infant son, David II. For a time the regency remained in the capable hands of Thomas Randolph, earl of Moray, but after his death a directing head and hand were lacking. Edward Baliol, the son of King John, supported by the oxiled Anglicising nobles, and with English aid, was actually able for a time to expel David and call himself king of Scotland, professing allegiance to Edward III of England. Yet he was unable to hold his own against the stubborn resistance of the Scots who refused to acknowledge his authority, and from 1338 onwards the English king was too much occupied with his French wars to deal strenuously with Scotland. Baliol was finally ejected, and David was restored in 1341. In 1346, when Edward was engaged on the Crecy campaign, David invaded England and was taken prisoner at Neville's Cross, and in Feb., 1356, Edward III made a great raid into Scotland known as the Burnt Candlemas; but the Scots were none the readier to acknowledge his claims to supremacy, and refused point blank to make terms for the release of their king which involved any submission to England.

The House of Stewart

David, the degenerate son of a great father, was ultimately released on the partial payment of an exorbitant ransom which was never completed. He died in 1371 and was succeeded by his nephew, Robert II, the high steward, the son of his elder sister, Marjory, the first king of the Stewart dynasty. The history of Scotland becomes for the most part the story of feuds between powerful nobles whom the kings could not control, varied by occasional conflicts with the English of the border, such as the notable battles of Otterburn, 1388, and Homildon Hill, 1402, in both of which the leaders were Douglasses and Percies.

In 1406 young James, the heir to the throne, was kidnapped on his way to France, and was detained thereafter as a prisoner in England for 18 years. During the greater part of that time his uncle Robert of Albany was regent of Scotland, his father, Robert III, having died a few days after the boy was captured. The most notable incident of this regency was the battle of Harlaw, 1411, where Donald of the Isles was heavily defeated by the earl of Mar. Soon after the Scots were providing great

contingents to fight in France against Henry V; they won a notable victory over the English at Baugé in 1421, though afterwards they were badly beaten at Cravant and Verneuil.

The release and return to Scotland of James I in 1424 were the signal for the opening of a struggle, not between baronial factions, but between the Crown—supported by the Church—and feudalism. James had seen in England a country which was under the reign of law, whereas in Scotland he found a country in which each of the great nobles sought to be a law to himself and to his neighbours. He himself ruled with a strong hand, arbitrarily, not without vindictiveness, but at least with a general resolve to protect the oppressed. Also, he promulgated sound laws derived from England which remained practically a dead letter.

Rivalry of the Douglasses

James was murdered in 1437, and 15 years later James II, barely grown-up, slew with his own hand the head of the mighty house of Douglas, which brought to a head the rivalry between the Crown and its most powerful subjects. In the next three years the Black Douglasses were nearly exterminated, but another branch, the Red Douglasses, earls of Angus, rose to power in their place, when the vigorous young king was himself killed in his 30th year by the bursting of a cannon, 1460. The nobles, whose power might have departed altogether if James II had lived for another 10 or 20 years, completely recovered their independence under his feeble son, James III, who was killed in 1488 when in flight from the battle of Sauchieburn, where he had been defeated by the insurgent barons.

A period of comparative progress and prosperity set in under his son, James IV, a popular prince whose marriage in 1503 to Margaret Tudor, daughter of Henry VII, gave the crown of England to his great-grandson exactly 100 years later. But the reign of James IV ended with disaster, for in 1513, as the ally of France, with which Henry VIII was at war, he invaded England and was killed, with the flower of the Scottish nobility, on the fatal field of Flodden, leaving his crown to a three-year-old infant, James V.

The reign of James IV is a landmark in Scottish history, partly because it is on the border-line between medieval and modern Scotland, partly because it brought the royal family of Scotland into the direct line of succession to the English throne which it was to occupy.

Scotland never during the Middle Ages was a homogeneous nation. The Scottish dynasty before Malcolm Canmore had brought the whole South under its control; but with Malcolm himself, and increasingly under his descendants, the dynasty ceased to be in fact Celtic; the Anglicising and feudalising of the whole South proceeded apace, though with a much stronger Celtic survival than in England; while the North remained almost entirely tribal and Celtic in speech and in customs. Celtic Scotland never amalgamated with feudal Scotland, but preserved the clan system and the customary jurisdiction of the chiefs. It was to this system that the Vikings also assimilated themselves, several of the most powerful clan chiefs being of a Viking descent. The Scotland known to the English was feudal Scotland exclusively.

Another point to observe is that no king in Scotland was able to centralise power in his own hands as Henry II centralised it in England; therefore none was able to rule in the tyrannical or arbitrary fashion attempted by John and Henry III; therefore there were no constitutional movements like those of the 13th century in England for defence against the illegal overriding of recognized law, no assertion of the rights of a national council in limiting the activities of the Crown, though a national council existed which, in John Baliol's time, borrowed from England the name of parliament.

The Scottish Parliament

The constitution of parliament itself was exceedingly fluctuating, nor was there any call for its frequent assembling, since it was only on exceptional occasions that special financial levies were required. Taxation and legislation, the two principal functions of the parliament in England, made such small demands in Scotland that there was normally very little for a parliament to do. Though the lesser folk were given rights of attendance, they had no desire to exercise them, and hence, before the first Stewart king was on the throne the practice had begun of parliament delegating its functions to a committee known as the Lords of the Articles, who were to all intents and purposes selected by the magnates who at the moment had the strongest armed backing behind them. For practical purposes the parliament existed only to register the decisions of the Lords of the Articles, who were themselves not elected representatives but the nominees of the faction dominant for the time being, whether it

happened to be the king's faction, or the Douglas faction, or some other. Nor did the parliament ever adopt the English practice of dividing into two chambers; it sat and passed its measures as a single chamber. And the commons represented in it were only the tenants-in-chief holding their lands from the crown, who still bore the general name of barons, and the burgesses.

Relations with England and France

After Flodden, chaos resumed its sway. The queen-mother Margaret Tudor took for her second husband the young earl of Angus, the head of the house of the Red Douglasses. Each faction now engaged in endeavouring to obtain control of the person of the young king, and with it a claim to act as the supreme authority in the state. Henry VIII interested himself chiefly in fostering these feuds; and almost the only permanent factors were the steady hostility of the clergy, headed by Archbishop James Beaton, to English influences, and—partly as a consequence—the close alliance of the crown and the Church, as soon as King James V was old enough to escape from his would-be guardians and assert himself. For the boy was imbued from the first with a deep distrust of his uncle Henry's intentions towards himself, while the Douglasses were Anglophile and anti-clerical.

James escaped from the Douglas tutelage in 1528, at the moment when Henry VIII was on the point of embarking on his quarrel with the pope, and used his new liberty to sweep the Douglasses away and to associate himself closely with the churchmen, who, very soon, guided by Cardinal David Beaton, were opening a persecution of the Protestantism which was just beginning to make headway. James sought to draw closer the old alliance with France, the constant rival of England, and to repress with extreme rigour the chiefs in the highlands and on the English border, who had hitherto been accustomed to an excessive liberty. The principle of establishing a central control was undoubtedly right; but again James was not given time to carry the work to completion, and the immediate effect of his policy was to revive in all its intensity the old antagonism between the feudatories and the crown, and to alienate the churchmen from the baronage as well as from the commons, who were assimilating heretical doctrines.

The lay magnates of Scotland turned greedy eyes upon the wealth of the Church, and saw therein the best of arguments for ranging

themselves on the side of the Reformation. Thus their attitude towards England became extremely fluctuating. England had thrown off the Roman allegiance, and therefore the Reformers looked to England for support, but the hostility to an English domination was still ineradicable. The well-warranted suspicion that the English government was only awaiting its opportunity to assert that domination still stood in the way of active cooperation between the growing party of the Reformation and England, while the monarchical and clerical party clung the more closely to the French connexion.

James died Dec. 14, 1542, and his daughter Mary, just a week old, became queen. The attempt of Protector Somerset in 1547 to force the Scots at the sword's point to marry their little queen to the young king Edward VI played into the hands of the anti-English party. Mary was sent off to France, while her mother, Mary of Lorraine, a Guise whose brothers headed the ultra-Catholics in France, presently succeeded in capturing the regency of Scotland. By seeking to turn the French alliance into a French ascendancy, and persisting in the clerical policy, she revived the strength of the opposition; Scottish nationalism was no more inclined to accept a French than an English domination.

Progress of the Reformation

The Reformation in Scotland was not as in England imposed by the authority of government, but was essentially a popular movement, with fierce conviction at the back of it, led by fearless zealots such as John Knox, and fervently embraced by anti-clerical magnates who formed themselves into a league, and assumed the title of lords of the congregation. In 1559 the struggle between Mary of Lorraine and the lords of the congregation developed into civil war; in 1560 Elizabeth sent military aid to the Reformers, the regent died, and the victory of the lords of the congregation was sealed by the treaty of Leith and the complete withdrawal of the French, leaving the government in the hands of the lords of the congregation—headed among the Reformers by John Knox, among the laity by Lord James Stewart (afterwards earl of Moray). In 1561 Mary returned to Scotland.

For seven years the queen strove vainly to establish her own authority; in 1568 she fled to England, where she passed the remaining 19 years of her life in captivity, while Scotland once more suffered from the evils of a pro-

longed regency. The country assimilated the Reformation in the acutely Calvinistic form which gave to it an extremely democratic ecclesiastical organization. The Presbyterian system is described elsewhere. Here we may observe that its root idea was the spiritual independence of the Church from lay control, and the spiritual authority of the Church over morals.

The General Assembly of the Church became in fact the organ of Scottish democracy as it had never been possible for the parliament to be, and the lay magnates soon found the pretensions of the clergy more embarrassing than those of the churchmen of old, while they themselves, as before, were torn by factions. The young King James VI, brought up in an atmosphere of civil turmoil, with dissimulation his own single safeguard, developed, not indeed high qualities of statesmanship, but an exceeding craftiness, turning the factions against each other and against the clergy on the general principle *divide et impera*, while he succeeded in introducing an episcopal element into the government of the Church.

His position gained strength when, as the great-grandson of Margaret Tudor, he succeeded to the throne of England on the death of Elizabeth in March, 1603. Under his manipulation, the Lords of the Articles, always the official legislature of Scotland, had come completely under his control; he could make sure that they were all king's men. He had procured a law under which the General Assembly of the Kirk could only be summoned by the king's authority; and in 1610 he secured for his bishops something like a predominant voice in that assembly. In effect, he ruled in Scotland with an absolutism unknown to any of his predecessors since the days of Robert Bruce. And he was shrewd enough, by the Articles of Perth in 1618, to carry his ecclesiastical victory just up to but not over the limits, the crossing of which would have aroused forcible resistance. The distribution of Church lands among the laity had reconciled the recipients to the king's ecclesiastical policy.

Policy of Charles I

Charles I lacked his father's cunning. He alienated the landholders by revoking to the crown the grant of ecclesiastical lands; and then in conjunction with Laud he went far beyond the Articles of Perth in ordering on his own responsibility the adoption in the Scottish churches of the Anglican ceremonial observances which were an abomination to Scottish Protestants. Men of almost all shades of

opinion combined in the signing of the National Covenant, 1638, declaring their loyalty to the crown but binding themselves to maintain the national religion. For the time the Scots acted as a united nation, obeying the governing committees which they appointed, and the General Assembly, though none had any constitutional powers. When the king threatened coercion he found that the Scots could oppose him with a better-organized army than any he could himself raise. In 1639 terms were agreed upon, but neither party took the requisite action to carry them out. Next year, when the unsatisfied Scots had marched into the N. of England practically unopposed, and the king, unsupported by the English parliament, could take no effective steps to coerce them, Charles found himself obliged to give way. In 1641 Charles visited Scotland again, and left it with the government and the military forces wholly in the hands of the Covenanted leaders, from whom the critical situation of the monarchy in England as well as in Scotland had now caused a considerable royalist secession.

Solemn League and Covenant

When the Civil War broke out in England in 1642, Scotland, a separate kingdom, at first stood aloof; but during 1643 the conviction gained ground that the victory of Charles in England would more than restore the royal domination in Scotland. The Scots entered upon the Solemn League and Covenant with the English Parliament for the maintenance of pure religion, but with a renewal of the protestations of loyalty embodied in the National Covenant. Next year the Scots army entered the N. of England, and in conjunction with Manchester and Cromwell won the battle of Marston Moor, which was practically the turning point of the Civil War. Royalism in Scotland now made its one desperate and brilliant effort under the leadership of Montrose, an effort which opened with his victory at Tippermuir on Sept. 1, 1644, and ended with his defeat at Philiphaugh, Sept. 13, 1645, when the king's cause had been lost in England at Naseby.

Charles chose to surrender himself to the Scots army, and the Scots in their turn handed him over to the English parliament and withdrew over the border. But Scotland had no confidence either in the Presbyterian politicians at Westminster or in the Independents of the army; Scottish Presbyterianism was intolerant of sectaries. The king, though in confinement, maintained active intrigues and offered

to the Scots terms which transformed many of them (known as the Engagers) into Royalists, who, in conjunction with the old Cavaliers, temporarily gained the upper hand in the government of Scotland in 1648. An army of Engagers entered England, but was completely shattered by Cromwell at the battle of Preston, and the Covenanters, headed by Argyll, recovered their ascendancy, but did not renew their former amicable relations with the English leaders, who proceeded to the execution of the king in defiance of the terms of the Solemn League and Covenant.

Cromwell's Victories

Scotland, then under its covenanted government, exercised its right as an independent state to negotiate with the dead king's exiled heir, and to receive and recognize him as King Charles II on his acceptance of the National Covenant, after Montrose's failure in an abortive campaign to restore him unconditionally. But the English Commonwealth could not afford to have Charles seated on the Scottish throne. Cromwell was dispatched to the north. The rout of Dunbar, where the military judgement of Leslie was overridden by the fanaticism of a clerical committee which attended the commander in the field, did not carry with it the subjugation of Scotland, but that result practically followed when the Scots army marched into England and was annihilated by Cromwell at Worcester, Sept. 3, 1651.

Monk had been left behind in Scotland as Cromwell's lieutenant. In the course of a few months he made himself master of the country, and, while the executive administration was assigned to him, an Act of the English parliament of 1652 incorporated Scotland with the English Commonwealth, and gave her representation at Westminster in place of her own national parliament, with full freedom of trade. Scotland yielded only a sombre acquiescence. Representation in the Commonwealth parliaments did not carry with it the idea of an independent political life, so dear to the Scottish heart. The benefits of commercial equality could not at once make themselves actively felt. In Scotland the administration remained dominated by Englishmen, and the sanction of the new government was provided mainly by English troops.

With the Restoration in 1660 the temporary union was dissolved. All Acts of Parliament since 1641 were cancelled and the status of that year was ostensibly restored. But the Royalist reaction was more uncompromising in Scotland than

in England. The Scots parliament reverted to its position as a body for registering the legislation of a committee who were in effect crown nominees, while the executive government was in the hands of a committee of the privy council, in which the extremist Archbishop Sharp was predominant. Scottish politics resolved themselves into a struggle in which moderate men sought freedom in religion, while the government enforced conformity to doctrines and practices wholly alien to the people of Scotland, and the extreme Covenanters denounced all departures from their own forbidden doctrines and practices with a virulence for which the only excuse was the flagrant tyranny with which the government enforced its own repressive measures. The persecution raged, especially in the western lowlands, practically throughout the reigns of Charles II and James VII, so that Scotland as well as England was ready to offer the crown to William and Mary when James took flight to France in Dec., 1688. The Jacobites (*q.v.*) found a brilliant leader in Claverhouse; but his death at Killiecrankie, July 27, 1689, ended all immediate hope of a Stuart restoration.

Effects of the Revolution

The Revolution gave to Scotland what it had never before enjoyed, a free parliament, not hampered by the Committee of the Articles controlled by the Crown; moreover William, realizing that to be an Episcopalian in Scotland was equivalent to being a Jacobite, assented to the abolition of the episcopal element in the Scottish Church altogether, and the establishment became Presbyterian without qualification, the condition being the toleration of nonconformity. Scotland then at last had a government less arbitrary and more nearly resembling that of England than she had ever before known. But her relations with England were unsatisfactory. William was in the first place a Continental statesman, the stadtholder of Holland, and in the second place king of England, a power very valuable to him in his European projects. To Scotsmen it appeared that the continued union of the two crowns would mean the effective subordination of Scottish to English interests.

Barriers put up in the interest of English trading interests throttled the commerce of Scotland, and she had no means of retahating. The massacre of Glencoe was attributed to the king's disregard of Scottish affairs; the disastrous failure of the Scottish Darien scheme (*q.v.*) was

laid at the door of English commercial rivalry. Jacobite sentiment was much stronger in the ancient kingdom of the Stuarts than in England, and was coupled with a passionate hostility among many of the clans to the typically Whig clan of Campbell. William himself and sundry intelligent statesmen in Scotland saw the solution of the various problems in an incorporating union which would secure to Scotland equality and freedom of commerce, her national institutions, and her national Church. The obvious alternative, a prolonged continuation of the existing system being impracticable, was a complete severance of the two kingdoms, probably to be accompanied by a Stuart restoration in Scotland.

Treaty of Union

However much reason might favour an incorporating union upon fair terms for Scotland, Scottish national sentiment persistently dreaded the subordination of Scotland to England under any conceivable scheme, while England remained apathetic, and English merchants were very little disposed to make any commercial concessions whatever. But with the accession of Anne in 1702, and the immediate necessity for both countries to fix upon the heir or heirs who should succeed her, the postponement of a decision was no longer possible. In both countries statesmanship triumphed over sentiment and prejudice; and in 1707 the treaty of Union was ratified by the two parliaments. England and Scotland were united in the single state of Great Britain with a single parliament, though in certain respects with separate administration, and without detriment to the institutions of either. The separate history of Scotland as a sovereign state ends formally with the Union, though the permanence of the Union remained in the balance until Jacobitism received its death-blow on the field of Culloden in 1746.

A. D. Innes

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LANGUAGE AND LITERATURE. In Saxonised Scotland, the northern dialect of Early English became largely modified by borrowings from the speech of the various races—Cymric, Pictish, Gaelic, Norse—who collectively may have included the bulk of its inhabitants, and while, later, the close relationship between Scotland and France introduced many French phrases and idioms into the language, the forms and methods, as well as the language, of Scottish verse were further affected by Chaucerian and other English influences. Thus by the 15th century the Scottish language had acquired a somewhat more varied and expressive vocabulary than contemporary English, though, owing to the break in the continuity of the vernacular literature and the increasing intercourse with England, many words and phrases gradually became obsolete.

Early Romantic Literature

Only fragments survive of the earlier patriotic minstrelsy, and only isolated stanzas of the older ballads. Also the rhymed prophecies and other poetic remains fathered on the famous Thomas the Rhymer lack authenticity, though he is the possible author of the meritorious romance of Sir Tristan. Of later date are certain surviving alliterative romances, some of which are attributed by Wyntoun to Huchown of the Awle Ryale, who may have been the Sir Hew of Eglinton of Dunbar's Lament. These romances partly affected the forms of later verse; but the distinctively Scottish literature properly dates from The Bruce of John Barbour, which, while it owes much to its patriotic theme, manifests a glowing enthusiasm and graphic force, quite absent from the rhymed Chronicle of Andrew of Wyntoun. The later Wallace of Henry the Minstrel (d. c. 1492), though fabulous more than historical, is metrically a great advance on The Bruce, and shows distinct evidence of indebtedness to Chaucer.

This great English master may have been introduced to Scottish versifiers by James I, to whom there is old authority for ascribing The Kingis Quair, written in the Chaucerian manner, and in a modified form of the Chaucerian dialect. James I has also been credited with those piquant pictures of the rude

horseplay of the rustic Scots in At Beltane and Christis Kirk, on which much later verse—including that of Fergusson, Ramsay, and Burns—was modelled. They further indicate the early existence of a school of native verse of more vital force than the Chaucerianism which later was partly engrafted on it. While Robert Henryson, with whom begins the golden period of Scottish verse terminated by the Reformation, shows himself in Orpheus and The Testament of Cresseid the mere disciple of Chaucer, his poetic individuality is better revealed in his purely Scottish Fables and minor verse, including the classic Robene and Makyn; and it is similarly so with his contemporaries and successors.

His contemporaries include Sir Richard Holland, author of a curious political romance, The Howlat, in the alliterative stave; John Affleck and John Clerk, who were mourned by Dunbar, and to the latter of whom five pieces are attributed in the Bannatyne MS., including the humorous wooing of Jok and Jynny, prototype of many subsequent songs, among others the modern Duncan Gray; Patrick Johnstoun, author of the severely didactic Three Deid Powis (Polls); Mersar, some of whose love ballads, praised by Dunbar, still survive; and Sir John Roulis, whose mock excommunication of The Stelaris of his Fowlis lacks nothing in coarse denunciatory vigour.

Of purely Scottish, and probably earlier, growth are those humorous burlesques of the romances, The Taill of Rauf Collyear, the extravaganza of Cockellio's Sow, King Berdok, the grim tale of The Gyre Carling, and the gentle *geist* (ghost) of Lord Fergus (Ghost).

Dunbar and Lyndsay

But head and shoulders above both his Scottish predecessors and contemporaries stands William Dunbar, a master metrist in a great variety of staves. Of Walter Kennedy, his chief contemporary, no very definite judgement can now be formed, only five pieces besides his vituperative *Flying with Dunbar* being now preserved. Strikingly contrasting with both is the grave and erudite Gavin Douglas, notable for his translation of the *Aeneid* into heroic couplets. Sir David Lyndsay, though a partial disciple of Douglas, was, like his great master Dunbar, a more trenchant moralist. Yet clever versifier—if not poet—though he was, he owed a popularity, which survived the Reformation, merely to his satiric exposure of Catholic corruptions, and indeed, foreshadowed the peculiar Protestant obsession which,

for a time, was to obliterate all interest in merely secular literature.

In the later verse of the Scottish Anacreon, Alexander Scott, and that of the less poetical, though metrically accomplished, Alexander Montgomerie, there is evidence of a close connexion with contemporary English poetry, which, but for the Reformation, might have resulted in a new school of Scottish verse wider in scope than the old one.

But these two names, with the lesser one of the genial moralist and satirist, Sir Richard Maitland, properly terminate the list of the old poets, for neither the patronage of James VI, nor his royal precepts nor example, could avail against the withering blasts of Protestant Puritanism. The Reformation also hindered the development of a native prose literature, which, for many generations, was exemplified mainly in the Scots-English of Knox's graphic History, the vivacious Chronicle of Lyndsay of Pittcottie, Bishop Leslie's History, and that curious political medley, The Complaynt of Scotland.

The character of the old popular songs is partly mirrored in the pietistic parodies of them in The Gude and Godly Ballatis of the Reformation. Other lyrics imperfectly preserved in Allan Ramsay's versions, as well as various fragments in floating tradition, indicate that the Godly Ballatis did not wholly extinguish the predilection for the old songs; but, with some slight exceptions, as Robert Semple, author of Habbie Simson, the Scottish poets of the 17th century were, like Drummmond of Hawthorneden, entirely Anglicised. Even, however, before Ramsay, interest in vernacular verse had begun to revive, as is witnessed by the songs of Lady Grizel Baillie, the Hardyknute of Lady Wardlaw, the verse of William Hamilton of Gilbertfield, and the publication of James Watson's Choice Collection of Scottish Poems.

Ramsay and Burns

But a new national impetus to the revival was given by Ramsay, through his publication of specimens of the older pieces from MSS., his versions of old songs, and his own vernacular and semi-vernacular verse. He had various contemporaries, including his rival in rancid humour, Alexander Pennecuik, Robert Crawford, author of The Bush Aboon Traquair and other Scots-English lyrics, William Hamilton of Bangour, author of The Braces of

Yarrow, and three woman song writers, Alicia Cockburn, Jane Elliot, and Lady Anne Barnard. Ramsay's main successors were the short-lived Robert Fergusson, a more refined and better disciplined versifier than Ramsay, and Burns, with whom the revived vernacular school culminated. Immediate predecessors of Burns were the excellent song writers, Alexander Ross, John Skinner, and Alexander Geddes.

The brilliant triumphs of Burns created a further host of aspirants, and by his editorship of Johnson's Museum and his support of Thomson's Scottish Airs he greatly stimulated enthusiasm for Scottish song. Here it is that we have the best examples of the later Scottish muse. Prominent among his contemporaries were Hector Macneill, Mrs. Grant of Carron, and the voluminous Lady Nairne. As poets, James Hogg and even Scott have won probably a more lasting renown by their songs—not, however, all quite Scottish—than by their poetical romances. Among other later versifiers are the sweetly sentimental Tannahill, the accomplished parodist Allan Cunningham, the boisterous humorist Alexander Boswell, and the strenuous realist William Watt, author of The Tinkler's Waddin, and Kate Dalrymple. The vernacular revival, however, was never more than a partial imitation of the old versifiers. It was ennobled by the unique achievements of Burns, but otherwise was limited in scope and tended to become more so, though it has still accomplished representatives.

T. F. Henderson

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Scotland, BANK OF Institution founded by an Act of the Scottish parliament in 1695 with the exclusive privilege of banking for 21 yrs., and the first bank to be established in Scotland. It absorbed the Central Bank of Scotland in 1868, the Caledonian Banking Co., Ltd., in 1907. In 1948 it had 228 branches throughout that country, and two offices in London. Head office, The Mound, Edinburgh.

Scotland, CHURCH OF. This subject is treated under Church of Scotland.

Scotland, COMMERCIAL BANK OF. Limited company established in 1810 by royal charter. Its head office is in George St., Edinburgh, and it has more than 300 branches throughout Scotland, with a chief office in Glasgow at 113, Buchanan St. It possesses several offices in London and engages in all forms of commercial banking, as well as issuing its own notes.

Scotland, NATIONAL BANK OF. This bank was established by royal charter in 1831 and incorporated as a limited company in 1882. In 1918 almost the whole of its share capital was acquired by Lloyds Bank, with which it maintains the closest association. Besides its head office in Edinburgh, it has branches in all the principal towns of Scotland and in the City and West End of London. It possesses a small note issue.

Scotland, ROYAL BANK OF. Incorporated by royal charter in 1727, this bank is unusual in that it has since 1924, by purchase or otherwise, set up extensive banking connexions in England. That year it absorbed the old concern of Drummmond and co., Charing Cross; in 1930 a substantial interest in Williams Deacons Bank was acquired, and the private banking business of the Bank of England at Burlington Gardens was transferred to the Royal Bank of Scotland; in 1939 the latter acquired the capital of Glyn, Mills and co. The bank has head offices in both Edinburgh and Glasgow, numerous branches throughout Scotland, and a foreign department in London.

Scotland, SECRETARY FOR. Official appointed in 1885 to be responsible to parliament for the public business of Scotland, hitherto shared by a number of government departments. Since 1926 he has ranked as a secretary of state and has had a parliamentary under-secretary. His offices are at Fieldden House, 10, Great College St., Westminster, S.W.1., and St. Andrew's House, Edinburgh. From 1707 to 1746 there was a secretary of state of Scotland.

Scotland, UNION BANK OF. Institution founded in 1830. The head office is in St. Vincent Street, Glasgow, and in addition to branches throughout Scotland, this bank has offices in London, and issues its own notes.

Scotland Yard. Familiar name for the headquarters of the Metropolitan Police in London, more correctly described as New Scotland

Yard. The headquarters were formerly at Great Scotland Yard, connecting Whitehall and Northumberland Avenue. This site was once occupied by a palace built for the reception of the kings of Scotland when they visited London—hence the name; Margaret, sister to Henry VIII, was its last occupant. It fell into ruin in Elizabeth's reign. The official residence of the surveyor of works to the crown was here, and residents included Milton, Inigo Jones, Sir J. Denham, and Sir J. Vanbrugh. See Criminal Investigation Department; Detective; Flying Squad; Metropolitan Police; New Scotland Yard; Police.

Scots Fusiliers, ROYAL. Regiment of the British army. The senior British fusilier regt. and the second oldest Scots regt. of foot, it was raised in 1676 by Charles, 5th earl of Mar, for the suppression of border lawlessness. From its hoddie grey uniform the regt. was nicknamed Mar's Grey-Breeks. In 1684 the regt. went



Scots Fusiliers badge

to the Netherlands for service against the French, and returned to Britain in 1694, when it was numbered the 21st Foot. It was given its title, the Royal Scots Fusiliers, in 1713.

Serving through Marlborough's campaigns, the 21st Foot earned particular distinction at Blenheim, and at Ramillies totally destroyed the Picardie regt. It covered the forces besieging Mons in 1709, and fought at Dettingen, 1743, and Fontenoy, 1745. Hastily shipped home, the 21st Foot formed part of the army that defeated Charles Stuart at Culloden. Its next major campaign was in the American War of Independence, and in 1794 it gained the honour Martinique. In the Napoleonic wars, a second battalion was raised, the regt. serving in Egypt, Sicily, Italy, and Holland. As a reward for its expert marksmanship in the American War of 1812-14, a sleeve badge of crossed muskets was granted, since adopted as the army's marksmanship badge.

Three honours were gained in the Crimean War, and one for the Zulu War of 1879. The regiment fought in the Boer War of 1880-81 and the Burma campaign of 1885.

It took part in the Tirah campaign of 1897, and served throughout the S. African War of 1899-1902. Eighteen battalions of the Royal Scots Fusiliers were raised for service in the First Great War and earned for the regt. the battle honours: Mons; Marne, 1914; Ypres, 1914, '17, '18; Somme, 1916, '18; Arras, 1917, '18; Lys; Hindenburg Line; Dorian, 1917, '18; Gallipoli, 1915-16; and Palestine, 1917-18. In 1926, to mark its 250th anniversary, the regt. was granted permission for its pipers to wear the Erskine tartan. In the Second Great War it served in France (1940), N. Africa, Sicily, Italy, Madagascar, and Europe. The regimental depot is at Ayr.

Scots Greys, ROYAL. Regiment of the British army. The only surviving regular cavalry regiment, the Scots Greys originated in three troops of dragoons raised in 1673 to hunt out the Covenanters. In 1681 three more troops were raised and the six regimented as the 2nd Royal Regiment of Dragoons of Scotland. From the colour of its uniform, not that of the horses, the regiment received its name; not until some years later was it mounted on grey chargers. The regt. served in Flanders under William III and was present at all Marlborough's victories. At Waterloo the Scots Greys charged with the Gordon Highlanders clinging to their stirrups, and Ensign Ewart captured single-handed the standard of the French 45th regiment. In commemoration of the exploit, the Scots Greys were awarded their eagle badge. They rode with the Heavy Brigade at Balaclava, and served in the S. African War.



Scots Greys badge

In the First Great War, the Scots Greys fought both as cavalry and dismounted troops, and earned the battle honours: Mons; Marne, 1914; Aisne, 1914; Ypres, 1914, '15; Arras, 1917; Amiens; Somme, 1918; Hindenburg Line; Pursuit to Mons. Stationed in Palestine at the outbreak of the Second Great War, they took part in the Syria campaign of 1941 as lorried infantry, and in 1942 were mechanised as an armoured regiment. They led the 8th army's advance from Alamein to Tripoli, and were first ashore at Salerno. The regt. was one of the first to land in Normandy in 1944; held

the Arnhem-Nijmegen "island"; and at Wismar, May 2, 1945, made the first contact of British troops with the Russians. The regimental depot is at Colinton, Edinburgh.

Scots Guards. Regiment of the British army.



Scots Guards badge

Raised in Scotland in 1641 by Charles I for service in Ireland, the regt. declared for the royalist cause in the Civil War and in 1651 was destroyed at the battle of Worcester. After the Restoration it was reformed in Scotland as the Scotch Fusilier Guards, and in 1686 moved into England. At the Union in 1707 it came on to the British establishment as the 3rd Foot Guards. The regt. gained its first honour at Namur in 1695 and then served in Marlborough's campaigns. It fought at Dettingen; was in Egypt in 1801; gained five honours in the Peninsula; and was with the Guards Brigade at Waterloo. In the Crimea it fought at Alma, Inkerman, and Sevastopol; it was at Tel-el-Kebir in 1882; and served throughout the S. African War.

Three battalions of Scots Guards served in the First Great War and won the honours: Mons, 1914; Marne, 1914; Aisne, 1914; Ypres, 1914, '17; Festubert, 1915; Loos; Somme, 1916, '18; Cambrai, 1917, '18; Hindenburg Line; France and Flanders, 1914-18. In the Second Great War the regt. served in Norway, N. Africa, and Italy, and with the Guards armoured div. in the liberation of Europe. It was a bugler of the Scots Guards who sounded cease fire in Europe on May 8, 1945. When in full dress, the regt. has tunic buttons grouped in threes, and no plume in the bearskin.

Scots Law. Law that prevails in Scotland. Up to the 14th century Scots law was substantially the same as English, apart from local customs. In the 16th century, however, Roman law permeated the whole structure of jurisprudence with the renaissance of letters, this change being mainly due to the fact that trained lawyers took the place of territorial chieftains in legal administration. During the 19th century Scots law again became more and more influenced by English law, although Scotland's separate jurisprudence was secured by the treaty of Union of 1707.

The supreme court in Scotland is the court of session created in

1532, whence lies an appeal to the house of lords. The sheriff courts are the county courts of Scotland, but the sheriff is both a civil and a criminal judge, and in most civil matters his jurisdiction is unlimited. This fact renders justice less expensive in Scotland. Solicitors practise before the sheriff almost exclusively, and court fees are not high. Appeal lies from him to the sheriff principal, or to the court of session.

Justices of the peace have civil jurisdiction only in claims for debts not over £5. They have criminal jurisdiction over all breaches of the peace and over the less serious crimes. They grant liquor licences. The magistrates of a burgh have a jurisdiction corresponding to that of justices.

Criminal prosecutions are under the charge of advocates-depute under the lord advocate and the solicitor-general. In every district there is an official prosecutor, the procurator-fiscal. Private prosecutions are almost unknown. There is, in Scotland, no preliminary public hearing, the preliminary investigation always being conducted in private.

The law in mercantile matters, e.g. sale of goods or bills of exchange, has come to be almost the same as in England, but Scots law does not regard consideration as essential to a contract. Great differences exist, however, between the laws of the two countries relating to land and wills. A man cannot by his will deprive his widow or children of all share in his estate. The widow may claim terce and jus relictæ and the children legitim. A widower may claim courtesy and jus relictii. For both husband and wife, these rights arise also on divorce.

The marriage laws formerly differed greatly, many forms of irregular marriage—such as the "Gretna Green" marriage—being recognized in Scotland; but in 1939 nearly all these forms were abolished and marriage before an authorised registrar became standard. From 1937, the laws of the two countries in divorce became more alike, although some differences continued.

Scotsman. THE. Scottish daily newspaper. Established in Edinburgh as a weekly, Jan. 25, 1817, it became a bi-weekly in 1823, and a penny daily in 1855. In its first 100 years it had only two managers, John Ritchie and James Law and six chief editors.

The Scotsman's first offices were two rooms in the High Street

In 1904 it moved to palatial offices erected in North Bridge Street. It has branch offices in Glasgow and London. The Weekly Scotsman and The Edinburgh Evening Dispatch, established in 1886, belong to the same firm, the Scotsman Publications, Ltd. See Cooper, C. A.

Scots Pound. Scottish gold coin, originally of the same value as the English pound. Through debasement of the coinage its value sank after 1355, till in the 17th century it was worth only 1s. 8d. It disappeared after the treaty of Union of 1707.

Scott, CHARLES PRESTWICH (1846–1932). British journalist.



C. P. Scott,
British journalist;
Holier

Born at Bath, Oct. 26, 1846, and educated privately and at Corpus Christi College, Oxford, he was editor, 1872–1929, of the Manchester Guardian (q.v.), of which he became governing director in 1921. The history of the Manchester Guardian during the period named is aptly described as the history of his mind, and he will be remembered as one of the most distinguished journalists of his time. He was Liberal M.P. for Leigh, 1895–1906. He died Jan. 1, 1932. His life, by J. L. Hammond, appeared in 1934.

Scott, CHARLES WILLIAM ANDERSON (1903–1946). British airman. He was born in London, Feb. 13, 1903, and joined the R.A.F. in 1922.

During 1927–30 he was engaged in Australia as an air-mail pilot. In 1931 he flew from England to Australia and back, taking 9 days 4 hours on the outward journey and 10 days 22 hours on the return. The following year he beat the England to Australia record by 5½ hours, his journey taking only 8 days 20 hours. In 1934, with T. Campbell Black, he won the Melbourne air race, covering 11,296 miles in 2 days 23 hours. His autobiography, Scott's Book, appeared the same year. He died April 15, 1946.

Scott, CLEMENT WILLIAM (1841–1904). British dramatic critic. Born in Hoxton, Oct. 6, 1841, and educated at Marlborough, he

began life as a clerk in the War office. Soon, however, he drifted towards journalism and dramatic criticism, and eventually became dramatic critic to the Daily Telegraph, being regarded as the best judge of acting of his time. His own efforts to write for the stage were not particularly successful, nor was The Free Lance, a paper which he founded after he had left the Daily Telegraph in 1898. He died June 25, 1904. Scott was the originator of a more picturesque style of criticism than former generations had known; but though his opinions carried weight, his work was often marred by personal prejudice. Consult Old Days in Bohemian London. Mrs. Clement Scott, 1919.



Clement Scott, British
dramatic critic
Elliott & Fry

Scott, CYRIL MEIR (b. 1879). British composer and writer. Born at Oxtou, Cheshire, Sept. 27, 1879, he studied composition in Germany, where his first symphony was performed at Darmstadt, 1899. He wrote many songs and ballads, and did valuable work in discovering, noting down, and scoring English folk-songs. His compositions included a piano concerto, a concerto for two violins, a cello concerto, La Belle Dame Sans Merci (first performed at Leeds, 1934), Neptune (symphonic poem), and an opera The Alchemist. He published several volumes of verse, e.g. The Celestial Aftermath; The Vales of Unity; his prose works included An Outline of Modern Occultism, and memoirs, My Years of Indiscretion.



Cyril Scott,
British composer

Scott, DAVID (1806–49). Scottish painter. He was born in Edinburgh, Oct., 1806, the son of Robert Scott, the engraver. He became an engraver himself about 1825, but the work was distasteful and he soon left it for imaginative design



David Scott,
Scottish painter
From a bust

In 1827 he helped to found the Edinburgh Life Academy Association, and in 1828 he exhibited a painting at the Scott'sh Academy. In 1831 he completed Monograms of Man, a series of six designs in outline, and commenced a series of outline drawings for *The Ancient Mariner*, published 1837. He died March 5, 1849. *Consult* Memoir, W. Scott, 1850.

Scott, DUKINFELD HENRY (1854-1934). British palaeobotanist. He was born in London, Nov.



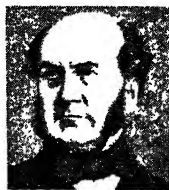
D. H. Scott,
British scientist
Lafayette

28, 1854, a son of Sir George Gilbert Scott (*q.v.*), and educated at Christ Church, Oxford, and at Würzburg. From 1882 to 1885 he was assistant professor of botany at University College, London, 1885-92 at the Royal College of Science, then until 1906 honorary keeper of the Jodrell laboratory at Kew. He cooperated with W. C. Williamson in researches into fossil plants, and wrote *The Evolution of Plants*, 1911; *Extinct Plants and Problems of Evolution*, 1924. He died Jan. 24, 1934.

Scott, DUNCAN CAMPBELL (1862-1947). A Canadian poet. Born at Ottawa, Aug. 2, 1862, he went to Stanstead College and thence into the civil service at 17. When he retired in 1932 he was deputy superintendent of the department of Indian affairs. Secretary of the Royal Society of Canada from 1910, he was chosen president in 1921. In 1934 he was made C.M.G. He died Dec. 19, 1947. Scott, who published his collected poems in 1926 and another vol., *The Green Cloister*, nine years later, is held by many Canadians to be their foremost poet, his lyrics and Indian pieces being particularly distinguished.

Scott, SIR GEORGE GILBERT (1811-78). British architect. He was born at Gawcott, Bucks, and articled to an architect in London.

The writings of Pugin gave him an insight into the principles of Gothic architecture, of which he became the leading English exponent. His buildings in-



Sir Gilbert Scott,
British architect

clude the Martyrs' Memorial at Oxford, the station and hotel at St. Pancras, some buildings of Glasgow university, and the Albert Memorial. He did an immense amount of restoration work on English cathedrals and churches, some of which was afterwards regarded as being unduly destructive of ancient work. He was elected A.R.A. in 1855 and R.A. in 1861. Scott, who was knighted in 1872, died at South Kensington, March 27, 1878, and was buried in Westminster Abbey. *See* Albert Hall; Albert Memorial; Doncaster; Glasgow illus. p. 3783; Harrow; Scott, Sir Giles.

Scott, SIR GILES GILBERT (b. 1880). British architect. Grandson of Sir George Gilbert Scott (*v.s.*), he was born Nov. 9, 1880, and educated at Beaumont. After a year's practice he designed successful plans for the Anglican cathedral at Liverpool, 1903, a dignified essay in modern Gothic. In addition to many ecclesiastical buildings, including the nave of Downside abbey, chapels at Charterhouse and Ampleforth abbey, his works include Battersea power station, the library at Cambridge university, and extensions to the Bodleian, Oxford. His design for the new Waterloo Bridge was accepted in 1934. Scott was appointed architect when Coventry in 1942 prepared plans for a new cathedral to replace that destroyed in 1940 by German bombs, but in 1947 he resigned because the committee would not approve his designs. Elected R.A. in 1922, he was knighted in 1924, was P.R.I.B.A., 1933-35, and was awarded the O.M., 1944.

His brother, Adrian Gilbert Scott (b. Aug. 6, 1882), was also educated at Beaumont. He designed many churches, his principal work being Cairo cathedral. The brothers were associated in the design of the new house of commons, and in 1945 Adrian was appointed successor to Lutyens as architect of the R.C. cathedral at Liverpool.

Scott or Soot, MICHAEL (c. 1200). Scottish reputed wizard. The facts of his life are obscure, but it is believed that he was of a Fife family, studied at Oxford and in Paris, and entered the service of the Emperor Frederick II. At Toledo he apparently gained suffi-

cient knowledge of Arabic to translate part of Aristotle into Latin from an Arabic version, and he is said to have introduced this translation to Oxford and other universities. According to Italian traditions he died in Italy, but other accounts, which Sir Walter Scott follows in *The Lay of the Last Minstrel*, make him return in the last years of his life to his native Scotland, being buried in Melrose Abbey. Among the supposedly authentic works attributed to him are treatises on generation, physiognomy, and alchemy. In Scottish folk lore many wonders were ascribed to his supposed powers.

Scott, MICHAEL (1789-1835). Scottish novelist. Born at Cowairs, Oct. 30, 1789, and educated at Glasgow university, he spent some years in the West Indies, but settled in business in Glasgow in 1822. His fame rests chiefly on *Tom Cringle's Log*, first published serially in *Blackwood's Magazine* between 1829 and 1833. It won the praise of Coleridge, and is still read. *The Cruise of the Midge* also appeared serially in *Blackwood* 1834-35. Both novels appeared anonymously, and Scott's authorship was not made known till after his death on Nov. 7, 1835.

Scott, SIR PERCY MORETON (1853-1924). British sailor. He was born July 10, 1853, and educated at University College, London. Entering the navy, 1866, he was promoted captain in 1893, and rear-admiral 1905. A member of the ordnance committee in 1894-96, he came into prominence by reason of the excellent shooting of the *Scylla* and *Terrible*, which he successively commanded, and for which the training of gunners by his "dotter" was largely responsible. He improvised the mountings for the heavy guns for *Lady'smuth* in the S. African War. He was captain of the *Excellent*, the R.N. gunnery school, 1903-05, inspector of target practice, 1905-07, and commanded cruiser squadrons, 1907-09. In 1910 he was created K.C.B. and in 1913 a baronet. He retired with admiral's rank, but rejoined on the outbreak of the First Great War, being some time in charge of the A.A. defences of London. Scott died Oct. 18, 1924.

Scott, ROBERT FALCON (1868-1912). British Antarctic explorer. Born at Outlands, Devonport, June 6, 1868, he was trained for the navy, and served as midshipman in the *Monarch*, and as lieutenant in the *Rover*, *Amphion*, *Sharpshooter*, *Vernon*, and *Vulcan*. 1887-92.

In 1900, having reached the rank of commander, he was selected to lead the national Antarctic expedition,



Robert F. Scott,
British explorer

commanding the *Discovery*, specially built for the expedition. The expedition sailed from London, Aug., 1901, returning Sept., 1904. Several discoveries of first importance were made (see Antarctic Exploration), and on his return, after many adventures, Scott was created C.V.O., and promoted to captain.

After several naval appointments, including the command in succession of a cruiser and two battleships, his last Admiralty service was as naval assistant to the second sea lord.

Scott left England on a second polar expedition in 1910, finally sailing from New Zealand on Nov. 29 of that year in the whaler *Terra Nova*. Winter quarters were established at Cape Evans, in McMurdo Sound, and a sledging journey was undertaken to lay depots before the winter set in, the ship meanwhile returning to New Zealand.

Scott himself made a spring western journey, and the great southern journey to the Pole itself was started by a pioneer party under Lieut. Evans in Oct., 1911, with motor-sledges, which were not a success. Scott himself followed in Nov. with ponies and

dogs. The supporting parties were left behind according to plan in $81^{\circ} 15'$, $83^{\circ} 37'$, $85^{\circ} 7'$, and in $87^{\circ} 35'$ the last supporting party bade good-bye to Scott on Jan. 3, 1912.

The final march was made by Scott, Wilson, Oates, Bowers, and petty-officer Evans, who continued over the great polar plateau until they reached the S. Pole, Jan. 18, 1912, only to find that they had been forestalled by Roald Amundsen (*q.v.*), who had reached the pole barely a month before. After this bitter disappointment Scott's party was overwhelmed in a blizzard on the return journey, when he and his party perished. Evans died first, Feb. 17. A month later came the heroic death of Oates (*q.v.*). The remaining three fought on, but were beaten, brought to a standstill, and died about the end of March. Their bodies were discovered by a search party, along with Scott's diary, which told the whole tragic story of great hard-

ship endured heroically but in vain. The diary is now in the British Museum. The news of the disaster did not reach Great Britain until nearly a year later.

Scott married in 1908. The king conferred posthumously the K.C.B. upon Scott, whose widow became known as Lady Scott. In 1922 she married Sir E. Hilton Young, later Lord Kennet (*q.v.*). She died July 25, 1947.

In his last letter to his wife Scott asked that their son, Peter Markham (b. Sept. 14, 1909), should be taught natural history. Peter distinguished himself as a painter of bird-life (exhibiting regularly at the R.A. from 1933), and during the Second Great War was a lt.-cmdr. in the Royal Navy.

Bibliography. The Voyage of the *Discovery*, R. F. Scott, 1905; Scott's Last Expedition, arranged by L. Huxley, 1913; The Great White South, H. G. Ponting, 1921; South with Scott, E. R. G. R. Evans, 1921

SIR WALTER SCOTT, BART.

Eric Linklater, LL.D., Scottish Novelist and Biographer

This Encyclopedia contains articles on the separate works of the great Scottish poet and novelist, e.g. Ivanhoe; Talisman; and on places associated with his life, e.g. Abbotsford. See also English Literature; Novel

Born in Edinburgh, Aug. 15, 1771, the son of a writer to the signet, Walter Scott was the great-great-grandson of that heroic figure, Auld Wat of Harden, whose prowess in Border forays made him a theme for ballads. The Scotts of Harden were an offshoot of the noble family of Buccleugh; Walter's mother was a Rutherford, whose family had longer roots in the marches than the Scotts themselves; and in his pedigree with Highland Campbells and MacDougals were names so notable in Border history as Murray and Swinton. His ancestry is closely related to his work, for it inspired his imagination and from boyhood he was familiar with much of the material on which he built his narratives in verse and prose, out of which he fashioned his characters, and which in his powerful re-creation became for countless readers an image of Scotland itself.

A childish ailment left him lame, but he grew to a robust pugnacious boyhood. He was a voracious reader, and far in front of his years for genius showed clearly in him at six. Circumstance prepared him for his vocation by surrounding him with a plenitude of books, female relations who had long memories and a taste for poetry, and the congenial scenery

of the Scottish capital and his grandfather's farm on Tweedside. Shakespeare and Spenser and Percy's Reliques, translations of Tasso and Ariosto, gave him more than his formal education at the High School and Town's College of Edinburgh, and apprenticed to the law at fifteen, in his father's office, he acquired early the habit of concentrated work. Legal drudgery, however, was relieved by the hearty social pleasures of the day, and he learnt to drink deep and carry his wine while still a boy. He had time enough, also, for exercise that abetted his natural vigour and gave him signal strength and uncommon physical endurance. He was admitted to the Faculty of Advocates in 1792, and five years later married Charlotte Carpenter, the daughter of a French refugee, who made him an admirable wife.

In 1799 he was appointed sheriff-deputy of Selkirkshire, in 1806 a clerk of session, and for the remainder of his life his professional duties constitute a necessary and important part of its pattern. Another part, of increasing significance, is composed of land, houses, and complicated financial affairs. His married life began modestly enough in rooms in George Street, but soon expanded to a house in North Castle Street and a cottage



Robert Falcon Scott. Statue of the Antarctic explorer, executed by his widow and erected in Waterloo Place, London

at Lasswade, half a dozen miles out of Edinburgh. The cottage was exchanged in 1804 for a lease of Ashieston on the Tweed, where the habit began of that prodigal hospitality which characterised his years in Abbotsford. It was in 1812 that he bought a farm on the road between Melrose and Selkirk and began to build the mansion that became, as wings were added and fields and farms accumulated, his dearest romance. Into the building of Abbotsford went his creative impulse, love of the Border, pride of family, the desire to leave both a habitation and a name; and it cost him more than £70,000. His financial interests began in 1805, when with a legacy he bought a third share of James Ballantyne's printing business; The Lay of the Last Minstrel had been published a few weeks before.

Scott's Poems

His discovery of a new romantic literature in Germany had first persuaded Scott of his own ability to write, and his Border piety led him, after some apprentice work, to gather and edit, to patch and mend the ballads which he published in his magnificent Minstrelsy of the Scottish Border in 1802. In The Lay of the Last Minstrel he became a poet on his own account, and its vivid energy brought him instant fame and popularity, which Marmion confirmed in 1808, and The Lady of the Lake enhanced in 1810. Twenty thousand devoted readers bought that captivating tale, and in the lustre of its author's genius Loch Katrine gleamed more brightly, the Trossachs became a place of pilgrimage. But poetry has its fashions, and these swift and gallant stories no longer stir the critic's admiration nor the ordinary reader's appetite. To the contemporary eye their poetic content seems thin and artificial, their psychological interest is scanty, their historical attraction has waned, and their economic background must infuriate the Marxist. But such is their dexterity, their picturesque and dashing vigour, that it is easy to imagine the enthusiasm they evoked, though in the temper of our time it may be impossible to share it.

Other narrative poems followed, of a diminishing quality, and before Scott began his major work, with Waverley in 1814, he had edited Dryden in eighteen volumes, Swift in nineteen, Somers's Tracts in thirteen, and done lesser work of a like nature, the sum of which revealed prodigious energy, unflinching delight in men and history,

and a glowing abundance of good sense. He was forty-three when Waverley heralded the succession of novels which raised him to the enduring eminence where he remains despite all the attacks that his hasty composition invites, that is provoked by his broad indifference to an intellectual conception of the art of novel-writing. His faults are obvious, but no more than occasional clouds do they obscure his Olympian virtues. His heroes and heroines may be little better than well-mannered puppets, his plots are sometimes ill-jointed; but he filled a world with characters—gallant and crotchety, generous and shrewd and grim—whom he made as human beings are made, with their feet on the earth and thoughts of their own and native speech, and with magnanimous invention he domiciled them in great stories where they jostle each other and come to grief, or escape it, as in the world itself. He had a vast, practical knowledge of humanity, he knew how men and women behaved, and he understood the material conditions of their life that influenced behaviour; he was not much interested, however, in the innermost springs of personality, and many of his leading figures who seem to require analysis are flatly idealised instead, and a story that might have been driven more convincingly to its conclusion by the compulsion of character, will depend upon a brilliant management of events. But how superb is the flux and compass of events, how splendid the background of courts and cities and darkling landscape!

In Waverley the tragedy of a lost cause is interwoven with a high-spirited comedy of manners; it was followed by Guy Mannering, written in six weeks, in which the old theme of a missing will inspires a narrative of tremendous gusto, and Dandie Dinmont and Pleydell the lawyer and Meg Merrilies are created with such vitality as seems almost to give them independent being. The Antiquary came next, a comedy of humours and country life, and the Mucklebackits, Jonathan Oldbuck, and Edie Ochiltree

enter the gallery of characters. Old Mortality dealt with the troubled times of the Covenanters, a grim and moving story in which can be studied, with pleasure and profit, the rich variety of Scottish speech and Sir Walter's surpassing skill in it. Rob Roy came in 1818, its weak construction redeemed by Bailie Nicol Jarvie, Andrew Fair-service, and Rob himself, and then the broad and crowded canvas of The Heart of Midlothian, that many count as the best of his novels; but whoever has a favourite tale is likely to defend it with a warmth that literary merit by itself does not provoke, and Goethe put Waverley beside "the best things that have ever been written in the world." The Legend of Montrose added Dugald Dalgetty and a loose but swiftly moving tale to achievement, and The Bride of Lammermoor a well-made tragedy played under a darker sky than usual. The pageantry of Ivanhoe no longer pleases, but was once most popular; The Abbot retrieved the failure of The Monastery, and was followed by the



Walter Scott

From the portrait by Raeburn

strongly drawn and richly decorated tale of Kenilworth. The dullness of The Pirate was forgotten in the brilliance of The Fortunes of Nigel, with its marvellous portrait of James I, whose learned kingliness has a proper companion in Louis XI of Quentin Durward, a novel that won the enthusiastic approval of the French. St. Ronan's Well and Redgauntlet, Woodstock and The Fair Maid of Perth, all have their lively merits and the former pair their devotees who give them distinguished praise; but now the drama of Scott's own life was coming to a more poignant and heroic close than any of his fictions.

His estate had survived more than one crisis before he was buried in the huge financial ruin of Constable, the publisher, and the London firm of Hurst and Robinson, with whom Scott and Ballantyne, the printer, had for long been deeply and untidily involved. Scott, who had been careless as well as extravagant, found himself liable for a debt initially estimated at £130,000. He accepted his re-

sponsibilities, and set to work to pay it. Within four years his creditors had received nine shillings in the pound and Scott was a dying man, killed by an heroic effort that made of his last writing not words, but deeds. He had always esteemed action more highly than books, set honour above the claims of art; and none of his Border ancestry ever showed, in extremity, a starker sense of honour.

He came home, after a voyage to the Mediterranean in the battleship *Barham*, and dying Sept. 21, 1832, was buried in the ruined abbey of Dryburgh. That his critical faculty was often inferior to his creative power is evident alike in his writings and his excessive adornment of Abbotsford; but the scope and generosity of his power are indisputable, and he was a great good man.

Bibliography. Among many editions of the *Waverley Novels* may be mentioned that edited by Andrew Lang, 1907-13; also the *Fine Art Scott*, 28 vols., ed. J. A. Hammerton, 1911. The *Poetical Works* were ed., J. L. Robertson, 1894. Indispensable to the student are *The Journal of Sir W. S.*, 1829-32, ed. Prof. Tait, 3 vols., 1947; *The Private Letter Books of Sir W. S.*, ed. W. Partington, 1930; *Letters of Sir W. Scott*, 11 vols., 1936. Lives include those by J. G. Lockhart, 1838; G. E. B. Saintsbury, 1897; A. Lang, 1906; John Buchan, 1932 (7th edn., 1947).

Scott, WINFIELD (1786-1866). American soldier. Born near Petersburg, Virginia, June 13, 1786, he received a commission in the artillery in 1808. Taken prisoner by the British in 1812, he was exchanged after a few months, and then distinguished himself in the battles of Chippewa and Lundy's Lane. He became commander-in-chief of the U.S. army in 1841, and conducted the successful war against the Mexicans, occupied Mexico City, Sept. 14, 1847. He died May 29, 1866.

Scott Glacier. Antarctic glacier in the Australian quadrant. It emerges by Cape Hoadley, 40 m. E. of the Denman Glacier, was discovered by the Mawson Expedition, 1911-14, and was named after Robert Falcon Scott (*q.v.*).

Scottish Borderers, KING'S OWN. Regiment of the British army. Raised at Edinburgh by the Earl of Leven in 1689, it was formed from a number of companies of Presbyterians who had opposed the Stuart attempt to impose episcopacy. The regt.'s first action was against Claverhouse's highlanders at Killie-

crankie (July 17, 1689) and for its gallantry was then accorded the privilege of marching through



King's Own
Scottish Borderers
badge

Edinburgh with colours flying and drums beating. The regt. later fought at Steenkirk and Landen and gained its first battle honour, Namur, in 1695.

It was part of the Gibraltar garrison in 1727-28, and was one of the British regts. at Minden. Further honours were gained at Egmont-op-Zoom and Martinique. The regt. served in the Afghan War of 1878-80, in the Chitral and Tirah campaigns, and throughout the S. African War. Twelve battalions of the K.O.S.B. were raised in the First Great War and gained the honours: Mons; Ypres, 1914, '15, '17, '18; Loos; Somme, 1916, '18; Arras, 1917, '18; Soissons-Ourcq; Hindenburg Line; Gallipoli, 1915-16; and Gaza. In the Second Great War the regt. fought in France (1940), N. Africa, and Italy, and had an airborne battalion at Arnhem. The depot is at Edinburgh.

Scottish Council (DEVELOPMENT AND INDUSTRY). Body formed in 1946 by the amalgamation of the Scottish development council—established in 1931 to promote economic development in Scotland—and the Scottish council on industry, set up in 1942 to safeguard and promote Scottish industrial development during and after the war. The Scottish council's aim is to promote the well-being of Scotland. It represents the local authorities, the central committee of Scottish chambers of commerce, the Scottish T.U.C., and the Scottish banks, membership being open also to firms, cooperative societies, trades councils, corporate bodies, officials, and private individuals. The council is completely independent, but cooperates with govt. depts. as well as with all responsible Scottish bodies.

Scottish Education Department. British government department through which the secretary of state for Scotland initiates legislation relating to education, the employment of children and young persons, children in need of care or protection, and public libraries. The Scottish universities, however, fall within the province of the chancellor of the exchequer and the university grants committee.

Under the Education (Scotland) Acts and other enactments the secretary of state makes codes, regulations, orders, and schemes relating to the conduct of schools, the training of teachers, the school meals service, the school medical service, approved schools, etc. The schemes of education authorities are subject to his approval, as are many proposals on points of detail. The dept. conducts the annual examination for the senior leaving certificate. It maintains close contact with the progress and development of education in Scotland through inspectors of schools stationed throughout the country. The dept. is in constant touch with other govt. depts. in Scotland, England, and N. Ireland about matters of common interest.

Scottish Geographical Society, ROYAL. Learned society founded in 1884. Its headquarters, which include a fine library, are at Synod Hall, Castle Terrace, Edinburgh. Members, ordinary and associate, receive the society's publication, *The Scottish Geographical Magazine*, and may borrow books from the library, and attend the lectures, which are delivered in Edinburgh, Glasgow, Aberdeen, and Dundee.

Scottish Home Department. Body whose functions include most of those assigned to the Home office in England. Its responsibilities include prisons and borstal services, questions of criminal justice and public order and the royal prerogative of mercy, after-care of offenders, administration of the licensing acts and shops acts, and (through the local authorities) police administration. Other activities include the administering of the general law relating to local govt. and administration, fisheries administration, and cooperation with English depts. which have no Scottish equivalent.

Scottish Horse. Territorial regiment of the British army. Raised in 1900 for service in the

S. African War, it came on to the territorial establishment in 1902. In the First Great War it served in Gallipoli, Egypt, Palestine, and France, and in 1921 was converted into an artillery unit. It was later remounted, but on the outbreak of the Second Great War was again



Scottish Horse
badge

converted to artillery, and served in N. Africa and Italy. In 1947 it was amalgamated with Lovat's Scouts as a divisional regt. of the Royal Armoured Corps.

Scottish Office. British government department. The office of secretary of state for Scotland is discharged by four main administrative depts. based on Edinburgh—the dept. of agriculture, the Scottish education dept., the dept. of health, and the Scottish home dept. The secretary of state, as "Scotland's minister," represents interests of Scotland in matters in which the responsibility throughout Great Britain rests with other ministers. The day-to-day administration of the Scottish depts. is conducted from Edinburgh, but each dept. has representatives in London for parliamentary duties and for maintaining liaison with English and U.K. depts.

Scottish Rifles. Alternative name for the regiment better known as the Cameronians (*q.v.*).

Scott Report. Report of committee on land utilization in rural areas. The committee (chairman, Lord Justice Scott) was appointed in Oct., 1941, and issued its report on Aug. 15, 1942. It considered the conditions which should govern building and other constructional developments in country areas consistently with the maintenance of agriculture, especially factors affecting the location of industry. After making the basic assumptions that govt. policy included the establishment of a central planning authority, the encouragement of industry and commerce, the maintenance of a prosperous agriculture, the resuscitation of village and country life, and the preservation of amenities, the committee declared that the drift of population to the towns could be countered by improving living conditions, and equalising economic, social, and educational opportunities in town and country, so that those preferring country life would no longer find themselves at a disadvantage. The land of Great Britain, it was declared, should be both useful and beautiful, and a number of proposals were put forward for the improvement of village living conditions. There must be ease of access for all to the countryside, but this must not interfere with the proper use of land. When industries come into rural areas they should be located in existing or new small towns rather than in villages or the open countryside; but rural trades and crafts or

hand-manufactures should be located in villages. The use of good agricultural land for building should be avoided whenever possible. (A minority report by S. R. Dennison expressed the view that the introduction of industry into the countryside might be of considerable benefit to rural communities, and some measure of it should be encouraged under effective control.) The committee recommended that a five-year plan should be formulated for the carrying-out of their proposals. This report, together with the Barlow and Uthwatt Reports (*q.v.*), led to the passing of the Town and Country Planning Act, 1947. *See* Town Planning.

Scour. Term applied to the washing away of friable material by the action of running water, as in the case of rivers, or the cleaning and maintenance of estuary channels by means of water released from sluicing basins. Scour in rivers tends to undermine the foundations of bridges, embankments, and other riverside works, and great care has to be exercised by engineers when interposing obstructions which may divert the current or otherwise modify the natural conditions, *e.g.* the construction of a bridge, pier, or other structure, or the reduction of the natural width of a stream in one place, may set up serious scour even at a distance, entailing extensive protective works to counteract its effect. *See* River.

Scouting. Term which originally referred to the ability of the Zulus and N. American Indians to track down their enemies by observing signs and deducing the course they had taken from the condition of the ground. In the military sense, scouting consists of sending small formations of lightly armed troops ahead of or out from the flanks to gain information. Until armies were mechanised, the scouts were usually cavalymen, but in 20th century warfare scouting is by light armoured cars or aircraft. In the Second Great War, a special scouting unit, the Reconnaissance Corps (*q.v.*) was raised. The term scouting is also used to describe the activities of the Boy Scouts (*q.v.*).

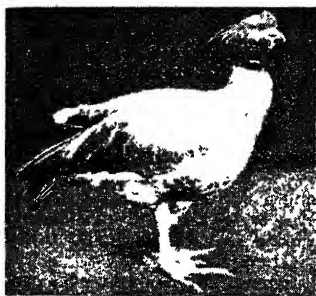
Scranton. City of Pennsylvania, U.S.A., the co. seat of Lackawanna co. It stands on the Lackawanna river, 135 m. N.W. of New York, and is served by the Delaware, Lackawanna and Western and other rlys. Among prominent structures are the U.S. government building, and the

Albright and public libraries. Anthracite coal mining is the staple industry, the mines underlying most of the city. Pop. 143,433.

Scraper-board. Prepared cardboard used by artists as an alternative to using pen and ink. The boards, cut to standard sizes, are primed with hard white china clay, on which is superimposed a soft black surface. The drawing is done with needles or scrapers of various widths, which remove the black surface as required, somewhat in the manner in which a block is prepared for wood engraving, leaving sharp white lines particularly suitable for reproduction.

Scrap of Paper. Popular name for the Quintuple Treaty, the breach of which was the immediate cause of the entry of Great Britain into the First Great War. The treaty was signed in 1839, and by it the neutrality of Belgium was guaranteed by Austria, France, Great Britain, Prussia, and Russia. It was in the interests of the major powers to make Belgium perpetually independent, and the Quintuple Treaty imposed a moral obligation on each signatory to respect its provisions irrespective of whether these were violated by others. Strictly, there were two treaties: the first, signed in 1820, wherein the king of the Netherlands agreed with the five powers to recognize the existence of Belgium as an independent and perpetually neutral state, bound to observe neutrality towards all other states; and the second, which was not signed by the Netherlands, whereby the five powers guaranteed the provisions of the first treaty. When the Franco-Prussian War broke out in 1870, the British govt. asked the belligerents to state their intentions with regard to Belgium, and duplicate treaties were signed in which both Germany and France reiterated their intention to respect Belgian neutrality while Britain undertook to declare war at once on any party infringing the proviso. When Germany broke the treaty by invading Belgium in 1914, and Great Britain announced that she would declare war, Bethmann-Hollweg, imperial chancellor, made to the British ambassador the historic remark: "Just for a scrap of paper Great Britain is going to make war on a kindred nation." *See* First Great War.

Screamer (*Chauna*). Small group of birds, including about three species. They are placed by zoologists between the ducks and the heron sub-orders. In size and



Screamer. The crested screamer, a bird of S. America
W. S. Berridge, F.Z.S.

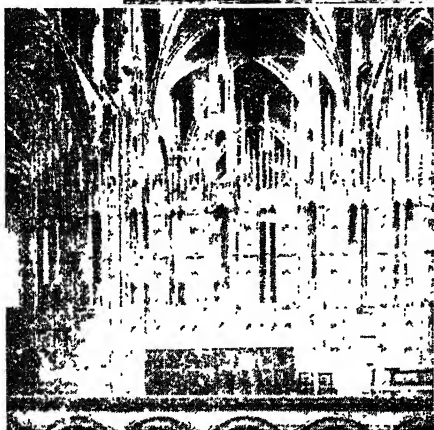
build they somewhat suggest the turkey; and their name derives from their harsh cries. They are restricted in range to S. America. Each wing is provided with two strong spurs. The horned screamer has a curious hornlike growth, about 5 ins. long, upon the forehead, and the plumage is grey and black with a greenish reflection. Other members of the group are without the horn. The birds are found in flocks about the borders of lagoons, where they scream through the night. Though not web-footed, they swim readily. See Horned Screamer and illu.

Scree. Accumulation of loose rock fragments at the foot of cliffs, etc. Scree is formed by the breaking off and falling of pieces of rock by frost action in colder regions, and by temperature changes between night and day in desert areas. Scree is always being replenished from above and tends to slide down into valleys, there to be carried away by streams.

Screen. In ecclesiastical architecture, a wall of wood, metal, or stone, having no structural function in regard to the rest of the building, and designed only to partition off one part of the church from another. Thus a private chapel may be shut off from the transept, and the chancel or the choir from the body of the church, by a screen, which may be carried round two or more sides of the part it is intended to seclude. The choir, or the choir and sanctuary, being the most important part of the medieval church, artistic ornament was lavished more freely on the screens protecting it than on any other part.

This was particularly true of the rood screen or *jube*, shutting off the choir from the nave or transept, which was generally a beautiful example of open or close Gothic workmanship, with a gateway in the centre and rood cross above it. The rood loft was at the top of this screen, with a staircase leading to it.

The screen round the choir at Chartres cathedral, enclosing it on the N. and S., is a fine example of 16th-cent. work. Notre Dame, Paris, Amiens cathedral, and the cathedrals of Lincoln, York, Canterbury, Durham, and Exeter provide good examples of the ornamental screen. Parish churches, such as those of Northfleet (Kent), Handborough (Oxon), Fyfield (Berks), retain wooden Gothic screens of attractive, if less sumptuous character. The term choir screen, when it is restricted to the barrier for the W. end of the choir, is synonymous with rood screen. The phrase "a screen of columns" is used of a detached colonnade. See Cathedral.



Screen. East side of the altar screen in Durham Cathedral, dating from 1372-80. Top, right, triple-arched choir screen in Exeter Cathedral, built in the early 14th century by Bishop Stapeldon

Screen. In photo-mechanical reproduction, a ruled glass grating that is placed between the photographic plate and lens in a camera to break up the negative of the copied picture into dots of various sizes for carrying the ink on the printing surface of the resultant half-tone block, corresponding to the light and shade in the drawing or photograph to be reproduced. It consists of two pieces of optically perfect glass, sealed together with Canada balsam, the inner surface of each being ruled with fine lines, cut by means of a diamond-point ruling machine, the lines of one glass running at right angles to the lines on the other when placed together. These lines are filled up level to the surface of the glass with an opaque ink so that the screen is formed of minute squares of light.

The screen is placed in a carrier in the camera, on runners, so that it can be placed nearly touching the photographic plate, or racked out to a given distance marked by a millimetre gauge, and the

reflected light from the drawing through the lens passing through the screen's minute squares of clear glass impinges dots on the photographic plate, larger or smaller according to the amount of light or shade in the drawing that is being reproduced. The screen rulings vary from 50 to 400 parallel lines per inch, according to the texture of paper the blocks are to be printed on. The thickness of the black line is about equal to the clear spaces between, in a half-tone screen. For photo-gravure plates a much finer line screen, with three times as much clear glass, is used.

A mezzograph screen has irregular dots instead of lines. A wavy line screen is occasionally

used for portraits (see Half-tone). Colour screens are another name for light filters placed in or in

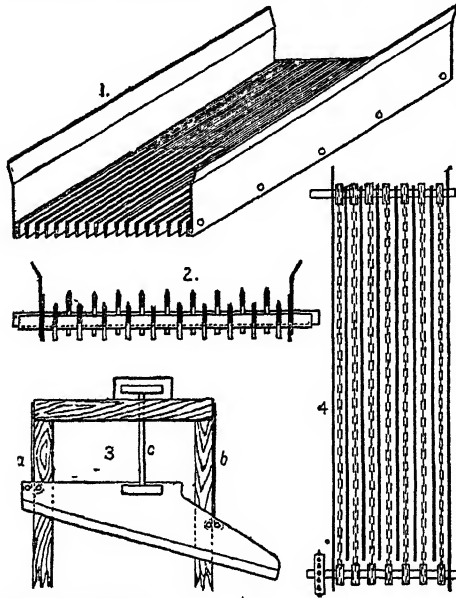
attached to a frame so suspended that it may be shaken to and fro. In the Briart screen the bars oscillate to and fro, at the same time rising and falling, so that when one bar is at its lowest point the two adjacent ones are at their highest. The coal is thus lifted as well as shaken backward and forward. Gyrotory and revolving screens are also used, though the capacity of the latter is comparatively low, as only a small surface of the screen can be in operation at one time. Electromagnetic screens, of wire meshes vibrating when an electromagnet works on alternating current, are increasingly favoured.

brightness of the projected image when seen from the side. In sound films, the screen has a number of small, evenly spaced holes so that acoustic transmission from the loudspeaker behind it is uniform. Cinema and magic-lantern screens are generally made of linen, but metal foil can be used. A radar screen consists of a sheet of glass upon which the received messages appear as spots of light. See Cinematography; Radar.

Screw. Mechanical device consisting of a cylindrical or conical body around which is formed a spiral rib or "thread." The invention of the screw is ascribed to Archimedes (*q.v.*), and its use is very ancient, though it was narrowly limited until the invention of machinery made possible the cutting of screws on wood or metal bodies with precision and cheapness. The screw is employed as a fastening for wood and metal; as a member for gripping objects or parts, feeding work to a machine, causing one member to approach or recede from another; and as a means of transmitting or changing motion—when so used, the screw is usually termed a worm (*q.v.*).

Wood Screws. Figs. 1-5 show various forms. The first is a dowel, to be screwed into one wooden part *e.g.* a curtain rail, and to have another member then screwed onto the projecting worm. Figs. 2 and 4 show wood screws of which the heads are wholly or partly sunk into the surface of the wood. In both these forms the outer part of the hole is countersunk—shaped to a counterpart of the sharply tapering underside of the screw-head. Fig. 4 (raised head) is not flush with the surface, but allow a slight projection. The patterns shown by Fig. 3 (round head) and Fig. 5 (cheese head) have the entire head raised above the surface. The cheese-head screw is little used for wood, but often for metal.

Early wood screws lacked the gimlet point which is now an essential feature; as a result, after a suitable hole had been bored, the screw had to be started by hammer



Screen. Common types employed in coal mining. See text

front of the lens when taking negatives, from which colour printing blocks are made. Filters are made from dyed sheet gelatine, or may be liquid dye in thin glass tanks, or even dyed glass. In three-colour negative making, each of the three colour screens used is dyed to a colour representing one different portion of the light spectrum that is divided up into three parts, for one screen violet blue, second screen green, and third orange-red. See Colour Photography; Colour Printing; Process Engraving.

Screen. In mining and metallurgy, an apparatus to separate the products of the mine according to size. Screens are used on a large scale for cleaning and grading coal. A common form for coal consists of plain iron bars set parallel in a frame which is fixed at an incline. The coal from the pit is discharged on to the screen at the top and falls down the incline; the dirt and small coal passing between the bars, while the good coal is delivered off the bottom of the screen into wagons. Special forms of bars prevent choking of the screen and facilitate separation.

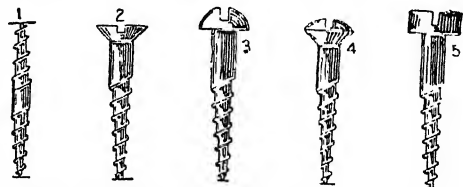
In modern forms the separation is assisted by some mechanical movement of the screen. The simplest is the jigging screen, formed of strong iron wire netting

In most designs, arrangements are made by which the space between the bars can be quickly changed and the size of the grading altered, without dismantling the entire apparatus. Screens are essential parts of gold-mining mills, and important adjuncts of most ore or stone breaking machines.

The figures show various types of screen. Fig. 1 is a common fixed inclined screen. The bars are closely set together in one part, and only allow dust and fine material to pass through. A wider spacing of the bars allows passage to small particles. In Fig. 2 is shown the Briart rising and falling bar-screen in cross section, and Fig. 3, the jigging screen. In the latter *a*, *b* are suspending, flexible rods; *c*, the jigging gear. Fig. 4 shows the Greenwell continuous chain and bar-screen. (See Stamp Mill.)

SCREEN, CINEMA.

A white, flat surface on to which the photographic image on a film is projected. The screen must have a high coefficient of diffuse reflection, and the deflection can sometimes be directed normally from the screen, reducing the

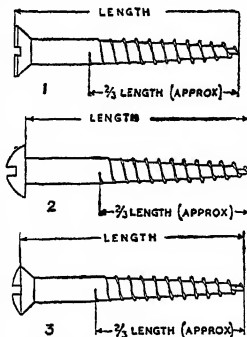


Screw. Patterns in common use. Fig. 1. Dowel for uniting pieces of wood end to end. Fig. 2. Countersunk. Fig. 3. Round head. Fig. 4. Raised head. Fig. 5. Cheese head

blows. The gimlet point of the modern screw enables it to cut its way into the wood, once a suitable hole has been bored; the hole must be smaller in diameter than the outside of the screw-worm, so that the thread can cut a counter-part in the timber and hold itself fast against a direct pull. The screw can then be withdrawn only by a twisting movement, the reverse of that by which it was driven in. Wood screws are right-handed, though screws for metal may in certain cases be left-handed (when a right-hand thread might result in the screw being unintentionally drawn out or loosened by movement of the parts secured together). Screws are made in diameters known by gauge numbers and standardised. The proportions of the various parts are also standardised. British Standard Specification No. 1210, of 1945 (see Fig. 6), governs the form of wood screws of mild steel and brass.

Coach screws are formed with a square or hexagon head to be turned by a spanner. Ordinary wood screws have a slotted head to receive a screwdriver blade. Various alternatives have been tried, including a head with a square-tapered recess and needing a driver of counterpart form. One of the most commonly adopted (mainly for metal) has a hexagonal recess formed in the head; a key made from rod of hexagonal cross section is used to drive or withdraw this type. A modern development, brought about by the widespread use of softish light alloys which permit a steel screw to cut its own thread in the metal member, is the screw which needs no tapping of a thread in a counterpart hole. It is inserted and turned home, and can be used in some of the synthetic plastics as well as some metals. The "drive-screw," of which one form is used for securing steel roofing sheets to wood members, is a cross between a screw and a nail; it has no gimlet point, and is driven home with hammer blows, and twists as it enters the timber. Ordinary wood screws are made in many metals and alloys; steel ones are finished with brass, nickel, chromium, or

copper coatings where the strength of steel is necessary and a more ornamental or rust-resisting coating is desired.

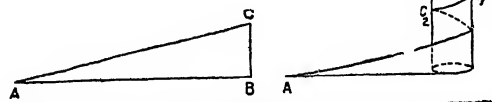


Screw. Fig. 6. British Standard Specification for screws for wood. 1. Countersunk. 2. Round head. 3. Raised head. See text

mechanical devices. Among commonly adopted screw-thread systems are the following: British Standard Whitworth; British Standard Fine; British Association; International Standard (Metric). In the U.S.A. a different series of standards was long used, though the divergences from the British forms were generally small. Following difficulties in wartime cooperation, it was agreed in 1948 to standardise the threads of British, U.S., and Canadian screws, nuts, and bolts.

Unless a corresponding nut is employed, a hole for the screw is drilled, and afterwards tapped by a steel tap which has the form of the screw to be inserted. The tap cuts away part of the metal around the hole to form a counterpart of the screw thread. When plain, unthreaded members are to be screwed into a tapped hole, or into a nut, a screw thread is cut on the member by means of a die or a screwing tool. Screws are made in a lathe-like machine, if the thread is to be actually cut. Other types of machine form screw threads by rolling the metal of the blank without cutting it. Screw threads on metal can also be formed by grinding.

THE SCREW AS A MECHANICAL POWER. Fig. 7 shows that, mathematically, the screw consists of an inclined plane applied around a



Screw. Fig. 7. Diagram illustrating principle of inclined plane applied to screw. See text

cylinder, and it may be regarded as a travelling inclined plane. This interpretation may be illustrated by cutting out a right-angled triangle in paper and wrapping it about a round ruler. In the figure the base of the triangle ABC lies entirely in a plane at right angles to the axis of the cylinder, and the hypotenuse AC traces out the spiral line Bb, b_1, c, c_1 , etc. The power is applied parallel to the base of the plane, and the plane is made to slide under the weight so as to raise it. The distance from thread to thread of the screw, measured parallel to the axis, is called the pitch of the screw, and this is the distance which the screw advances for one turn of the screw head or of the lever arm which is placed at the head, as in a screw press.

Screw Press and Lathe

The screw press was a very early application of the principle of the screw for applying pressure, by causing one member to approach another. It was used for the wine press by the ancients, and persists today in many appliances of the same class. In early printing presses the platen was pressed down on to the type bed by a screw. About 1797 Henry Maudslay (*q.v.*) introduced the screw-cutting lathe, of which the salient feature was a long and accurately cut "lead-screw" which moved the cutting tool along the lathe bed and enabled screws identical in pitch with the lead-screw to be cut mechanically. The use of alternative gear wheels, brought into engagement between the headstock of the lathe and the lead-screw, enabled screws of differing pitch to be cut by arranging the appropriate ratio of advance in relation to the revolutions of the headstock drive mechanism.

The improvements which followed made possible, in turn, the cutting of yet more accurate lead-screws and other screws to form part of machines. One outstanding application may be mentioned—the dividing engine, in which rules and parts of instruments are graduated with an extreme degree of accuracy. Here the lead-screw governs and controls the advance of the cutting tool which inscribes the graduation lines on the work. See Lathe.

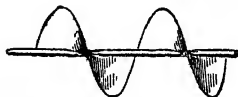
J. St. D. Reed

Screw OR MARINE PROPELLER. Contrivance for propelling vessels by rotating sections of an archimedean screw against the resistance of the water. Claimed on doubtful authority to have been used in conjunction with man power by the Chinese in ancient days, it was suggested by Van Drebbel and Hooke in the 17th cent. and by Du Quet, Bernouilli, Bushnell, and Bramah in the 18th with no practical success, although William Lyttleton in 1794 did actually move a ship with one in a London dock. Among a number registered were, in France, the patent of Frederic Sauvage (1832) and, in the U.K., those of John Ericsson, a Swede, and F. P. Smith, a British farmer, both 1836. The early ideas were opposed on the ground that it would be impossible to steer a vessel pushed from astern.



A two-bladed propeller of the older type

Screw propeller with single convolution as first fitted to Archimedes



Sir Francis Pettit Smith's first screw propeller



Double-threaded screw propeller as subsequently fitted in the Archimedes



A modern propeller

Screw. Primitive and modern types of screw propellers

By the 1840s a number of different types of screw had been invented; inefficient by 20th cent. standards, they were a great improvement on the paddle wheel. Twin screws, tried by Col. Stevens in New York in 1804, were not greatly favoured until the power of steamers increased to a point where there was a danger of breaking the propeller shaft if it were transmitted to a single screw. Later triple screws were introduced for special purposes, and even quadruple screws came into use for very high powers.

Most screws patented were three-bladed, the four-bladed type, once popular, being virtually restricted to cargo vessels with slow running machinery. When the turbine was first tried afloat, the

high speed at which it had to be run, with the engine directly coupled to the shaft, made it necessary to design propellers of special shape with a large blade area; the introduction of reduction gearing between the turbine and the shaft gave far better results and made it possible to fit the more normal type of screw. Observed experience and tank tests led to great improvements between 1920 and 1940, particularly in the evolution of the aerofoil blade in which each section is given the shape and curvature best suited to the water conditions at each point from the shaft to the tip.

Propellers are measured by their diam. and pitch, the latter being the distance through which the propeller would advance in one revolution if it acted on a solid medium. The slip is the difference between this pitch and the actual advance of the ship, which varies widely with different types of propeller and under differing conditions at sea.

The airscrew is described under that heading.

Screw Pine (*Pandanus*). Genus of trees and shrubs of the family Pandanaceae (q.v.). They are natives of tropical countries, chiefly of Malaya. Their stems are rough with the bases of the shed leaves. The leaves are leathery, mostly very long and slender with spiny margins and midribs. Some of the shrubs are used in a young state for conservatory and table decoration. *P. utilis*, a native of Mauritius, where it is known as Vacana, is cultivated for the sake of its leaves, which are plaited to make sacks for exporting raw sugar. The species with trunks are much disposed to the production of aerial roots which strike straight down into the soil. When firmly rooted the base of the stem dies away.

Scriabin, ALEXANDER NICHOLAIEVICH (1872-1915). A Russian composer. Born at Moscow, Jan. 10, 1872, he studied at the conservatoire there under Taneiev and Safonov, and later achieved a European reputation as a pianist. Professor of the piano at Moscow conservatoire during 1898-1904, he afterwards devoted himself to composition. His earlier work for piano was delicate and poetical, but in his larger orchestral works he was strongly influenced by Wagner. He introduced a revolutionary system of harmony, involving the absence of the major and minor modes and

the key-signature, subordinating his music to his mystic philosophy. His major orchestral works included *The Divine Poem*, 1905; *The Poem of Ecstasy*, 1908, and *Prometheus*, 1910. His piano pieces, some of which are now regarded as classics, included the *Poème Satanique*, études, and sonatas. He died at Moscow, April 14, 1915. His nephew was V. M. Molotov (q.v.). Consult *Lives* by A. E. Hull, 1916; A. Swan, 1923.



A. N. Scriabin, Russian composer

Scribe (Lat. *scriba*, clerk or secretary). Term used in the Bible for a writer or secretary, but more especially for the official copyists and expounders of the Law of Moses. As a distinct class or profession, they arose about the time of Ezra, when it became necessary to translate the Hebrew scriptures into Aramaic. Their most important function was to give counsel and advice in all points of difficulty or doubt about the observance of the law; and they might be described as ecclesiastical lawyers. They were closely connected with the Pharisees, the religious teachers of the nation; and their influence in N.T. days was very great. Leading scribes conducted schools or colleges, in which they taught their principles and methods to their disciples. Many of them sat in the Sanhedrin, and some appear to have acted as local judges. They were supposed not to accept payment; and some of the greatest of them are known to have earned a livelihood by trade. They were among the bitterest opponents of the mission and teaching of Christ. See *Inkhorn*; *Writing*.

Scribe, AUGUSTIN EUGÈNE (1791-1861). A French dramatist. Born in Paris, Dec. 24, 1791, he was educated for the law, but turned to writing for the stage in 1811. During the following half century he produced, alone, and in collaboration with numerous other writers, upwards of 400 plays, including comedies, e.g. *Le Mariage d'Argent*, *Une Chaîne*; emotional dramas such as *Adrienne Lecouvreur*; historical dramas such as *Bertrand*



Eugène Scribe, French dramatist

et Raton, Le Verre d'Eau; farces and vaudevilles, such as La Demoiselle à Marier; and opera-librettos, such as La Juive, Les Huguenots, Le Prophète. His immense success was due to his technical dexterity, but his methods were mechanical and the literary value of his work is very slight. He died in Paris, Feb. 20, 1861. Consult Eugène Scribe and the French Theatre, N. C. Arwin, 1924.

Scriblerus Club. Literary group formed by Jonathan Swift (*q.v.*) in 1714. It was directed towards the satirising of "the abuses of human learning in every branch" and the ridicule of pedantic writing. Its members included Pope, Bolingbroke, John Gay, Thomas Parnell, and John Arbuthnot, whose satire, *Memoirs of Martinus Scriblerus*, appeared among Pope's works in 1741.

Scribner's Sons, CHARLES. American publishing house. It was founded in 1846 in New York



Charles Scribner,
American publisher

by Charles Scribner (1821-71), and Isaac Baker, and has been carried on since by Scribner's sons, being incorporated in 1903. In 1865 the firm established a periodical called *Hours at Home*, which in 1870 became *Scribner's Monthly*, under the control of a separate company. It was sold in 1881 and re-named *The Century Magazine*. *Scribner's Magazine* was started in 1887 by the younger Charles Scribner (1854-1930), who became identified with *Charles Scribner's Sons* in 1875, and was first president of the American Publishers' Association. In 1928 the firm was chosen to publish the 20 volumes of the *Dictionary of American Biography*.

Scrip (abbrev. of subscription). In finance, an allotment letter or other document provisionally entitling a person to certain stocks, shares, or other securities. It is usual, when new stocks and shares are allotted, to send to the applicant documents stating the amount of shares he is entitled to, the money he has already paid and the money he has still to pay, with the date of payment. This can be changed for a certificate when the transaction is completed.

These scrip certificates, to which the term scrip is usually applied, must be stamped, 2d. if less than £5. a shilling if more.

Script (Lat. *scriptum*, written). In law, an original document, as opposed to a copy. Script is also a term for any style of handwriting; in printing, type imitating cursive writing. It is also used of the MS. of a play, a film scenario, or a radio feature. See Writing.

Scriptorium (Lat. *scribere*, to write). Room in ancient religious houses where manuscripts were copied or written. The term originally meant a metallic stilus used for writing. See Abbey.

Scripture. Alternative term for the Bible, sometimes in the plural form, the Scriptures. Hence the word is commonly used in schools for the study of the Bible as a classroom and examination "subject." Equivalent terms in this sense are Divinity and Religious Knowledge.

Scripture Reader. A name given to lay workers in connexion with certain religious and philanthropic organizations, who read the Scriptures in the homes of the bedridden poor and others willing to receive their message.

Scrivener (Lat. *scriba*, a scribe). Literally, one who writes. It was generally used for one who drew up contracts or copied out documents. See Scribe; Writing.

Scrivener's Company, THE. London city livery company. With records dating back to 1357, it



Scrivener's Com-
pany arms

obtained its first charter in 1617, the original members being notaries and attorneys. Its hall, in Noble Street, and most of its records were destroyed by fire in 1666, the rebuilt hall being sold to the Coach and Coach Harness Makers' co. in 1703. The office is at 56, Victoria Street, S.W.1.

Scrofula. In human beings, a complaint associated with the enlargement of the lymphatic glands in the neck. Known to be a form of tuberculosis, it is most usual in children, but is sometimes seen in adults. The treatment consists in invigorating the system with tonics and maintaining the patient's strength. Streptomycin, penicillin, and sulpha drugs have proved useful; incisions to relieve suppuration are sometimes advisable. See Tuberculosis.

Scroggs, SIR WILLIAM (1623-83). An English judge. Born at Deddington, Oxfordshire, and educated at Oriel and Pembroke Colleges, Oxford, he was called to the

bar at Gray's Inn, 1653. He became a king's serjeant, 1669, a justice of the court of common pleas, 1676, and lord chief justice, 1678-81. He died Oct. 25, 1683.



Sir William Scroggs,
English lord chief
justice

Scroggs was notorious for his conduct of the Popish Plot trials. He showed an animus against those on trial so great that it led him to subvert the law, and he exhibited a gloating savagery to those found guilty which has never been exceeded in English courts. The attitude of Scroggs underwent a sudden and complete reversal at the trial of Sir George Wakeman and others, the reason for which has never been satisfactorily explained. See Oates, Titus; Popish Plot.

Scroll. Roll of paper or parchment. It is used by analogy for a writing in the form of a roll. In hydraulics a scroll is a spiral waterway placed round a turbine to regulate the flow of water. In



Scroll in ornamental ironwork

architecture it is an ornament of a spiral or volute (*q.v.*) pattern. It is sometimes used of the volutes of the Ionic capital. See Ionic Order.

Scroll Clutch. Machine-tool chuck in which the jaws are moved in and out by the action of a scroll-shaped or spiral member, having teeth cut in it which engage with corresponding teeth in the jaws. See Lathe.

Scrolls of the Law. Documents kept in every Jewish synagogue. They contain the five books of Moses, hand-written on parchment, as they were in the synagogues of the Babylonian Dispersion. Wound on two short sticks, which protrude through rich velvet or silken covers to receive finely-wrought clusters of small silver bells, the scroll is unwrapped for the public reading by the minister of the "portion of the law" for each Sabbath and festival. It is then held aloft and turned about for all to see, re-

covered, and returned to the Ark, in which it is kept.

Special scribes earn their living by writing these scrolls. No ancient examples exist, because by Jewish law directly a single letter becomes obliterated, the scroll must be buried in consecrated ground.

Scrooby. Village of Notts, England. It is 2 m. by rly. S. of Bawtry, and was once a post town



Scrooby, Nottinghamshire. Manor house in which lived William Brewster, a leader of the Pilgrim Fathers

on the Great North Road. Here the archbishop of York had a palace, of which there are some remains. William Brewster (c. 1560-1644), one of the leaders of the Pilgrim Fathers (*q.v.*), lived at the manor house here.

Scrooge, EBENEZER. Chief character in Dickens's story *A Christmas Carol* (*q.v.*). A harsh, miserly old man, he is transformed into a cheerful, warm-hearted, and beneficent citizen, by a series of ghostly visits to the Christmases of the Past, Present, and To Come. On stage and screen the part has been notably played by Sir Seymour Hicks.

Scrope, RICHARD LE (c. 1350-1405). English prelate. Son of the first Baron Scrope of Masham, he was ordained in 1377, became bishop of Coventry and Lichfield, 1386, and was translated to York, 1398. After the deposition of Richard II, in 1399, popular discontent and the desire of Richard's supporters for revenge resulted in various rebellions against Henry IV, one of which Scrope headed with the earls of Northumberland and Nottingham, May, 1405. Treacherously persuaded to disband their force, Scrope and Nottingham were arrested, hastily and irregularly tried, and sentenced to death by Henry's order. Scrope was beheaded near York, June 8, 1405. The first archbishop to suffer as a traitor, he was regarded as a man of high character.

Scrophulariaceae. Large family of herbs and shrubs, natives of all climates. They have opposite or whorled leaves, and irregular flowers. The fruit is usually a capsule, containing many seeds. Some of them provide medicines, purgative or emetic. *Digitalis* (Foxglove) is a sedative, much used in heart complaints, but very poisonous. Other well-known plants comprised in the order are

Mullein (*Verbascum*), Snapdragon (*Antirrhinum*), Musk (*Mimulus*), Veronica, Eyebright (*Euphrasia*), Calceolaria, and Pentstemon.

Scrub. Term applied to land adjacent to woodland, covered with bushy shrubs and small trees. In Britain the shrubs are mainly those of a thorny character, such as furze, blackthorn, white-thorn, wild rose, and bramble. In the S. of Europe and Asia acacias are dominant. Along the Mediterranean the scrub is known as maquis. In E. Africa, euphorbias and cacti are mixed with acacias. Australia has several sorts of scrub: the brigalow and the mallee, the cane and the nettle. The brigalow scrub consists chiefly of *Acacia excelsa*; the mallee of *Eucalyptus dumosa*.

Scruple (Lat. *scrupulus*, a small stone). Unit of apothecaries' weight. It is 20 grains or minims, and the twenty-fourth part of an ounce.

Scrutiny (Lat. *scrutari*, to search out). In general, a close examination. In elections, a scrutiny is the examination by some recognized authority of the votes cast, so that any wrongly given may be rejected. A scrutiny is one of the methods used in the election of a pope.

The French term for voting by papers or balls is *scrutin*. In French electoral procedure since the Revolution, two alternative methods of voting have been employed. *Scrutin d'arrondissement*, or election by single member constituencies, was adopted in 1792, 1820, 1831, 1852, 1875, 1889, 1919; *scrutin-de-liste*, or election *en bloc* of all the deputies allotted to a department, was the method in 1795, 1799, 1801, 1817, 1848, 1871, 1885, 1919, and 1945.

The reasons for these frequent changes of procedure are somewhat obscure. Gambetta was a vehement advocate of *scrutin-de-liste*, as tending to give a less parochial spirit to the popularly elected assembly, but the system was not changed until after his death, owing to the fear of his becoming inconveniently powerful through the wholesale election of his nominees. See Ballot; Election; Proportional Representation.

Scud. Word used to describe ragged fragments of low cloud (*fractostratus*) carried along rapidly by a strong wind, generally beneath a layer of raincloud.

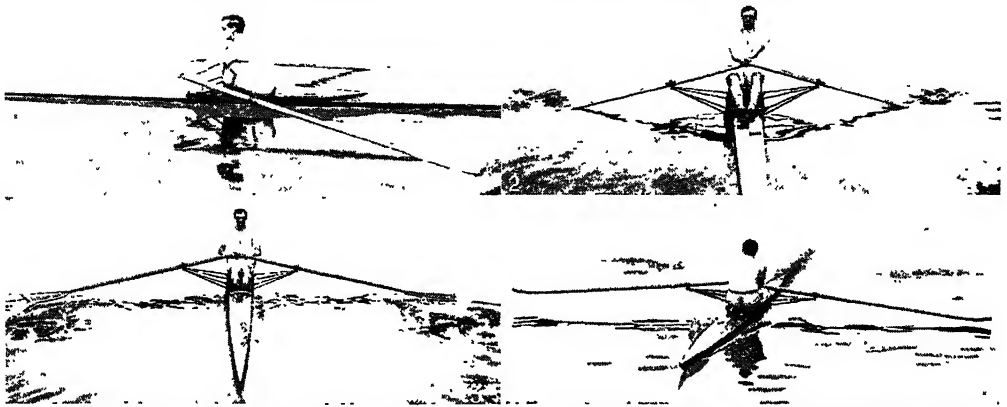
Scudéry, MADELEINE DE (1607-1701). French romance writer. Born at Havre, Nov. 15, 1607, she was left an orphan, and after a good education joined the literary circle of the Hôtel Rambouillet in Paris, becoming one of the leading *précieuses*. Her prolix romances, *Ibrahim*, *Artamène, ou le Grand Cyrus*, *Clélie*, etc., were written with the help of and in the name of her eccentric brother Georges (1601-67). With their chivalrous adventures, high-flown sentiment, and thinly veiled allusions to personages of the day, they enjoyed immense popularity. She died in Paris, June 2, 1701.



Madeleine de Scudéry, French author

Sculling. Propelling of a boat by one man, or occasionally two men, each with a pair of sculls, the blades of which are more concave than an ordinary racing oar, and have shorter looms. The art of sculling differs in some degree from ordinary rowing, in which one oar only is handled by each rower, and there is a cox to steer the boat. A good oarsman is not necessarily a good sculler. Sculling demands a greater knowledge of oarsmanship; hence the finest exponents have invariably been professionals.

It is necessary for the hands to work perfectly in unison, and for both sculls to be put in the water exactly together, with equal power applied to both. Failing these essentials, the stern of the boat will swerve from side to side. Some landmark should be noted and an endeavour made to keep the boat's end in a perfectly straight line with it. This must be steadily practised until the boat can be propelled without causing it to make the least deviation from a straight



Sculling. Principal positions in carrying through a stroke. 1. Forward position. 2. Half-way through stroke.

3. Blades extracted and wrists turned. 4. Coming forward

From *The Complete Oarsman*, by R. C. Lehmann, by courtesy of Methuen & Co.

course. The sculls should be as light as possible; length about 9 ft. 9 ins., and width of blade 6 ins. The sculls should be kept feathered until the full extent of the swing is reached, at which point the blades should be turned square at the exact moment of being dipped into the water. The art of sculling consists in keeping the boat going smoothly and continuously; there should be no jerky movement, especially at the beginning or finish of a stroke.

World professional sculling championships have been held in various countries, many on the Paramatta river, N.S.W., over a

course of 3 m. 330 yds. The championship course on the Thames is from Putney to Mortlake, and measures $4\frac{1}{2}$ m. The amateur championship of the Thames is also sculled over this course, the event being known as the Wingfield Sculls. The Diamond Sculls is one of the events at Henley Regatta (*q.v.*), over a course of 1 m. 550 yds. Other races are the University Sculls at Oxford, and the Colquhoun Silver Sculls, and the Lowe Double Sculls at Cambridge. In English sculling the Barry family have made the greatest name. *See Boat; Rowing.*

Praxiteles; the Renaissance in Italy the supreme Michelangelo, Donatello, Verrocchio, and Bernini; the Medieval in England such masters as William Torel, John of St. Albans, and Peter the Roman. Besides these familiar names, one recalls great statues which they made. The Parthenon marbles, the Hermes of Praxiteles, and the Charioteer of Delphi. The Venus de Milo is perhaps the most famous marble in the world; like the Victory of Samothrace, it is now in the Louvre, Paris. Then there are Michelangelo's Slaves, his Pieta in S. Peter's, and his colossal David, carved out of a block of Carrara marble 18 ft. high. Donatello made the bronze equestrian at Padua called Gattamelata, and Verrocchio the equally remarkable equestrian in Venice called the Colleoni. The exquisite statues of the kings and queens of Judah on the West Portal of Chartres will be remembered by all visitors to France, and the effigy of Henry III by Torel in Westminster Abbey is one of the world's finest bronze figures.

Sculpture is of all scales. It is sometimes colossal, sometimes diminutive. The Egyptians cut great statues in the solid rock, as at Abu Simbel (*q.v.*). The Sphinx is enormous, and is one of the sights of Egypt. Most well known of the Greek examples is perhaps the Colossus of Rhodes, a gigantic statue in bronze which stood with one foot on each side of the harbour and permitted the passage of ships between the striding legs. Eastern cultures provided many colossal Buddhas. There are the tremendous statues on Easter Island, the origin of which is not known but which bear testimony to a highly developed people.

SCULPTURE AND SCULPTORS

Charles Wheeler, R.A.

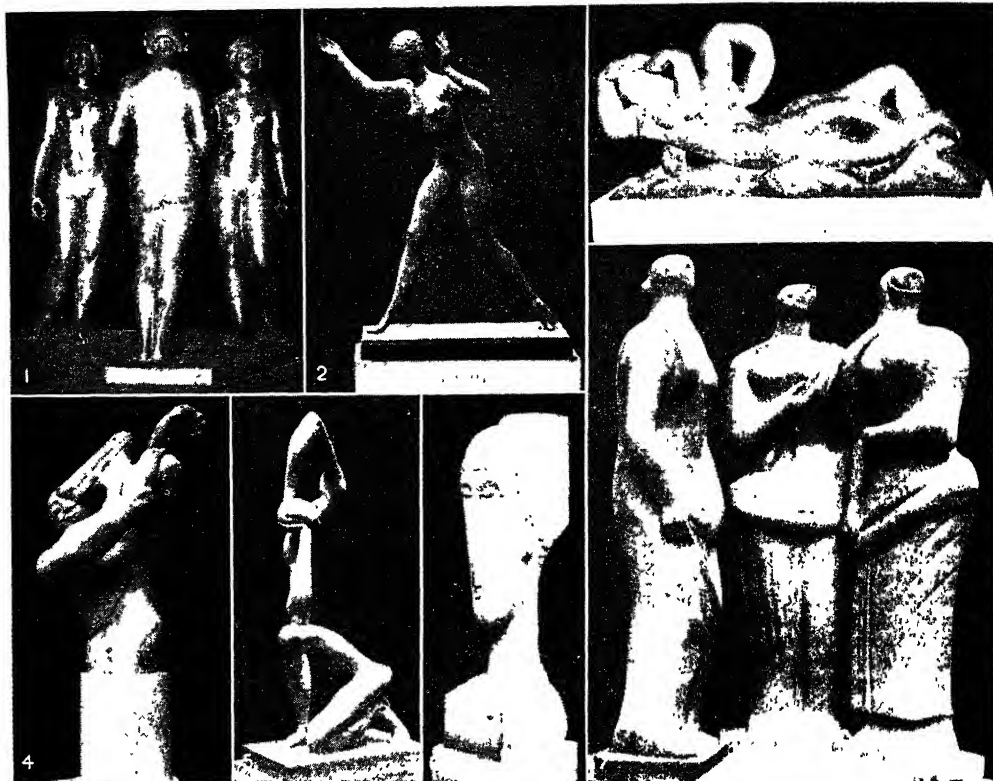
See also the separate articles on great sculptors, e.g. Donatello; Michelangelo; Pheidias; and the many illustrations of pieces of sculpture throughout this Encyclopedia, e.g. Apollo; Colleoni; Ixstern; Hercules; Laocoon. See also under Archaeology; Art; Babylonian; Egypt; Greek Art; Roman Art, etc.

Sculpture is the art of carved and moulded form and may therefore be divided into glyptic sculpture and plastic sculpture. The art has been practised as long as man has been civilized. It is the most durable of the arts, and sometimes it is only by their sculptural remains that a civilization is known to have existed. Like the other arts, it reflects the customs, thoughts, and feelings of the men of the time and place of its production. It is a stony mirror in which are reflected the men who made it and the men for whom it was made.

The ancient cultures fostered sculpture. The Egyptians, Babylonians, Assyrians, Greeks, Romans in the West, the Chinese and Indians in the East, all produced sculpture of a high order. The Renaissance people, especially in

Italy, and the medieval people all over Europe were remarkable for their sculpture. Down to the present day in all countries of the world, sculpture exists here and flourishes there in spite of wars, and political, social, economic, and religious upheavals. It is a form of human expression which will not be denied, so that nowadays when the steady flow of tradition has given way to a mere violent movement, sculpture manifests itself in a multitude of diverse and experimental ways. Modern sculpture, like modern painting, continues to portray as it has always done the character of contemporary times and people.

Associated with all great cultures are the names of their great sculptors. The ancient Greek produced Pheidias, Lysippus, and



Sculpture. Varying 20th century styles as revealed in the remarkable open-air exhibition of sculpture in Battersea Park, London, throughout the summer of 1948. No. 2, representing Spring, is the work of Charles Wheeler, R.A., writer of this article. The others are by: 1, Maillol; 3, Laurens; 4, Maurice Lambert; 5, F. E. McWilliam; 6 (designed as a door jamb), Modigliani; 7, Henry Moore

Travellers to New York will not forget the colossal Liberty at the entrance to New York harbour. Diminutive sculpture is represented by Chinese jade carving and the ivory carvings of the Gothic peoples. Of the former, the jade horse from the wonderful Eumorfopoulos collection now in the British Museum is known everywhere, and the numerous madonnas, many retaining in their design the shape of the tusk from which they were carved, will be recalled by visitors to museums in every part of Europe and America.

Sculpture is made either by chiselling down from a block of marble, stone, or other solid matter until the desired shape is achieved (the glyptic method), or it is made by adding piece to piece of some plastic material until the design is accomplished. There are no other ways except a combination of both, as happens when cast concrete is finished by chiselling. The second, or plastic, method usually requires to be cast in another material than that in which it is built up, so that it may become hard and per-

manent. Clay or wax becomes plaster or bronze or concrete. The resultant forms often differ in character, carved work tending to be fuller and modelled work thinner.

The process of casting sculpture has not varied through the centuries. The waste-wax or *cera perdata* method described by Benvenuto Cellini in his Memoirs being the same today and the one most suited to fine sculpture. Bronze is the best alloy for sculpture because of its ductile qualities, its strength, and its colour. With age it takes on lovely patinas which are frequently artificially made by chemical treatment.

Marble and stone are most generally used for carved sculpture, though granite, wood, and ivory are also commonly employed. Semi-precious and extra hard stones are less frequently carved or rubbed into sculptural shape. Marble was made famous by such names as Pentelicos and Paros in Greece and Carrara in Italy. Granite and basalt, sandstones and limestones were used by the Egyptians, the Renaissance scul-

tors, and those of the Middle Ages and today. When wood was used, it was generally covered with gesso and coloured. All sculpture was, until about 300 years ago, coloured, monochromatic sculpture being comparatively recent.

Nine-tenths of sculpture deals with the human form and draperies, and portrays gods, heroes, virtues, and famous men. Animals are also a popular subject, and the lions of the Egyptians and Assyrians, the horses of the Greeks and Chinese, the strange beasts taken from the medieval bestiaries—all appear in their respective places. In recent years, together with the art of painting, sculpture has produced exercises in so-called abstract form. Throughout the ages sculpture has been an expression of man's intelligence calling for the skill of his hands, the keenness of his eyes and mind, and the depth of his feelings.

Bibliography. A History of Sculpture, E. H. Short, 1907; Sculpture of Today, K. Parkes, 2 vols., 1921; A History of Sculpture, G. H. Chase and C. R. Post, 1924.

Scunthorpe. Borough of Lincolnshire, England. It is 25 m. by rly. W. of Grimsby and has iron and steel works, blast furnaces, etc. Market days, Fri. and Sat. Pop. est. 51,500.

Scurf. Popular name for dandruff, the tiny scales shed from the skin of the scalp. A certain amount of scurf is normal; excess can be caused by several organisms: the acne and the bottle bacilli, and the staphylococcus albus. In all skin diseases it is most important to clear the scalp of scurf; many skin affections of face and body occur and persist because of infection from scurf dropped from the scalp. Scurf, which tends to recur, is treated by rubbing weak ammoniated mercury ointment well into the scalp before washing the hair; by using a suitable lotion containing mercury and salicylate, and by washing the brush and comb every day.

Scurvy. Disease due to a disturbance of metabolism, resulting from the absence of vitamin C (ascorbic acid) from the diet. Scurvy was formerly very prevalent among prisoners, armies in the field, and sailors on long voyages, all unable to obtain fresh food. The onset of the symptoms is insidious, the early indications being loss of weight, increasing weakness, and anaemia. The gums become swollen and spongy, and bleed easily. The teeth may fall out and necrosis of the jaw occurs. The skin becomes dry and rough, and subcutaneous haemorrhages are present. The spleen is enlarged, and the urine contains albumen.

Treatment consists in adding to the diet foods rich in vitamin C, to make good the deficiency recognized as the cause of the disease. Most cases are cured by giving doses of vitamin C by injection, the juice of two or three lemons daily, and plenty of meat and fresh vegetables and salads. If the stomach is disordered, and unable to absorb readily, scraped meat and milk and lemon-juice should be given. For the gums a mouth wash of potassium permanganate or dilute carbolic acid should be used. For the prevention of scurvy, the board of trade requires all ships to take on board a sufficiency of anti-scorbutic articles of diet. Scurvy is one of the few morbid conditions in which the preventive is known, as well as the certain cure.

Scurvy Grass (*Cochlearia officinalis*). Perennial herb of the family Cruciferae. It is a native of N.W. Europe and the Polar

regions, growing near the sea and on mountains. From the root-stock many fleshy stems arise, also spoon-shaped leaves. The stem-leaves are stalkless, angled, and their bases clasp the stem. The four-petalled flowers are white. Eaten raw, e.g. in a salad, it is a valuable anti-scorbutic medicine.

Scurvy Pea (*Psoralea*). Large genus of shrubs and herbs of the family Leguminosae. They are



Scurvy Pea. Leaves and flowers of Jesuit's Tea

like flowers are blue, purple, or white, clustered in heads, spikes, sprays, or bundles. *P. esculenta*, a N.W. American species, has a turnip-shaped farinaceous root, which the French voyageurs called Pomme blanche or Pomme de Prairie. They are boiled for eating, but are rather insipid. *P. glandulosa* (Jesuit's Tea), a native of Chile, is applied as a poultice to wounds, and an infusion of the root is emetic.

Seutage. Term used in feudal times to describe the money payment made by a knight in place of following his lord on military service. It comes from the Latin word *scutum*, a shield, and is literally shield money. As conditions of warfare changed, it was often irksome for owners of land to render their customary military service; they were glad to commute it for money, and the kings were often equally glad to receive this money. In England it was first paid in the time of Henry II. See Feudalism.

Scutari or SHKOVËR. Town of Albania. Situated on the Bojana (Boyana), S.E. of Lake Scutari, it lies 12 m



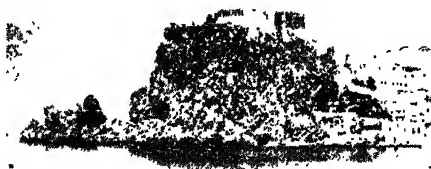
Scurvy Grass. Flower-head and leaves

from the Adriatic. It has woollen manufactures, and exports maize, tobacco, hides, and sumach. Pop. 29,209. In the first Balkan War the town was besieged by the Montenegrins, and afterwards by the Serbians; but the place held out until April, 1913. During the First Great War it was occupied at first by Montenegro, but after Serbia and Montenegro were overrun in 1915-16, it was seized by the Austrians, who held it until Oct.-Nov., 1918. Lake Scutari, partly in Albania and partly in Yugoslavia, is 27 m. long, and its greatest width 10 m. See Albania.

Scutari. This town of Asiatic Turkey is described under its alternative name of Uskudar.

Scutum Sobieski. One of the smaller S. constellations. It lies in the Milky Way between Aquila and Sagittarius. The constellation includes the well-known horse-shoe or ω nebula, a number of star clusters, and the variable star R Scuti. The constellation was so named by Hevelius in 1690, in honour of King John Sobieski of Poland. See Constellation.

Scylla and Charybdis. In Greek mythology, a sea monster and a whirlpool on opposite sides of the Straits of Messina at the narrowest part. Scylla had twelve feet and six heads, and snatched sailors from the decks of the ships that passed too near, while Charybdis three times a day sucked down the waters and threw them up again. Ships that tried to avoid Scylla ran the risk of being swallowed in the whirlpool of Charybdis on the other side. Odysseus and Aeneas were among the heroes who successfully negotiated the perils of Scylla and Charybdis. Another legend regarding Scylla relates that she was originally a sea nymph. Jealous of the love of Glaucus for her, Circe (*q.v.*) put poisonous herbs in a well where Scylla bathed, and the lower part of her body became the tail of a serpent surrounded with barking dogs. The town on the rock, now known as Scilla, was destroyed by earthquake in 1908. *Pron.* Silla; Karib-dis.



Scylla. Rock on the Calabrian coast where the monster of classic fable was supposed to dwell

Scyros or **SKYRO**. Greek island in the Aegean Sea. It is 24 m. N.E. of Euboea, is one of the N. Sporades, and has an area of 80 sq. m. It comprises two mountainous peninsulas, culminating in the S. at 2,700 ft. Most of the people live in Skyro or St. George, on the site of the ancient Scyros. Goats and sheep are reared; wine, wheat, and oranges are produced. Pop. 3,500.

Scythe (A.S. *sithe*, cognate with Lat. *secare*, to cut). Hand implement for cutting grass or corn.

The long, curved blade has a ridged back, and is cranked on at rather less than a right angle to a long wooden handle or snath, which is held by small gripping handles. The snath may be either straight or, more usual, curved. For the cutting of corn a sort of cradle is often attached. The angle of attachment of the blade can be adjusted, and in whetting a scythe the whetstone must be kept flat upon the blade, or the edge will be ground off. See Reaping.

Scythia. Name given in ancient times to an indeterminate region lying N. and N.E. of the Black Sea. Its confines differed from age to age according to different writers, of whom Herodotus was the fullest; but the physical boundary was always the edge of the forest, and the term Scythian was usually applied to any barbarian—i.e. non-Hellenic—inhabitants of this region. These inhabitants, according to ethnologists, appear to have been a mixture of Scythians proper from upper Asia, and Cimmerians, the previous occupants of the land.

The Scythians, who appeared in the 7th century B.C., gave their name to the country, but were absorbed among the Cimmerians. About the same time another horde of invaders who have been identified as Scythians appeared in Media, but this identification is not undisputed. About the end of the 6th century B.C., Darius I, the Persian king, attempted an invasion of European Scythia, but without any permanent result. From the middle of the 4th cen-

tury the power of the Scythians declined before that of the Sarmatians, new invaders from the east, who occupied their country, and by the 1st century B.C. the name Scythia had ceased to have any political significance. The Scythians of early times were a nomadic people, but with the progress of time agriculture was developed and a smattering of Greek culture introduced.

The classical history of Scythia has been greatly expanded and elucidated by modern archaeology. Sculptured figures at Behistun and Persepolis, 6th century figurines from Memphis, and vase-scenes from the kurgans of Russia, depict a physical type inclined to squatness and corpulence, wearing tall caps, loose breeches tucked into soft boots, and skin cloaks. Such garments needed no fibula; it is the torcs and armlets that are characteristic. The short dagger, socketed celt, unequal bow, three-sided arrow-heads, and bowcase (gorytus) were such as an Altaian mounted nomad would naturally adopt. The women lived under servile conditions. During migrations they occupied felt tents or yurts mounted upon ox-drawn wagons, pointing to their being non-nomadic Iranian captives. The food embraced the products of the chase, besides horse-flesh, soured mare's milk (koumiss), beans, and onions, and ox-haggis. The cooking pots were pedestalled metal cauldrons.

The religion was interpenetrated by central Asian shamanism, just as many social institutions and customs—hemp vapour-baths, blood brotherhood—were of nomad origin. On the death of a chief his women-folk, grooms, and horses were immolated with his funeral car. Gold, commoner than bronze, was stamped into plaques for sewing upon clothing and horse-trappings. Gold jewelry, often of supreme excellence, was produced by Greek artisans for the Scythian market; in one grave-mound—Kul Oba, near Kerch—the gold weighed more than 120 lb. The beast-motive—griffin, lion, bird—developed out of eastern material, and passed to Scandinavia and Britain, becoming absorbed into the art of early Ireland, and the Anglo-Saxon graves. Thus Scythian denotes a medley of racial and cultural elements, Altaian and Iranian. See Scythians and Greeks, E. H. Minns, 1913. *Prom. Sithia*.

Sea. Name of a portion of the ocean. The use is general in the phrase the South Sea Islands, but

more particular in North Sea, Caribbean Sea, Mediterranean Sea, where the land provides more or less precise boundaries. By extension the word is applied to inland bodies of salt water, e.g. Caspian Sea, Dead Sea, and Sea of Aral. See Ocean.

Sea Anemone. Name given generally to the Anthozoa or Actinozoa family of the coelenterate animals, abundant in rock pools on the coast. In structure they may be said to consist of a short thick tube, enclosed in a leathery skin and firmly attached to the rock by a sucker-like disk at the base. They can, however, very slowly change their position by a gliding motion. Around the mouth they have rings of tentacles, usually forming a multiple of six. These are of the most varied and beautiful hues, and when expanded give the animal the appearance of a flower. They can be retracted when the animal is alarmed, or for the purpose of enfolding food, and the creature then resembles a blob of jelly.

Anemones are carnivorous and feed largely on the minute organisms, such as crustaceans, which come within reach of the tentacles, while some of the larger species can take in mussels and other molluscs, as well as pieces of dead fish. Some of the smaller species take up their abode on the shells of gastropod molluscs and the carapaces of crabs, and it is common to find an anemone and a hermit crab sharing an empty whelk shell. The remarkable difference in size in the anemone when expanded and retracted is due to the fact that the body cavity is largely filled with fluid; in contraction this is expelled through the tentacles, which are hollow and provided with fine holes at the tips. In many species the tentacles have stinging cells which paralyse the prey, and in some of the tropical species are capable of inflicting a very severe sting on man. The British species, numerous and varied in both form and colour, are quite harmless except to small organisms.

Reproduction usually takes place from eggs, but often the larval stage is passed within the body of the parent. Some species propagate by a kind of budding or division of the basal disk. The sexes may be either separate or united in the same individual. Anemones are easily kept in a marine aquarium, but they should if possible be introduced attached to the stone or rock on which they



Scythe. Implement for cutting long grass

were found. The water should be well supplied with minute crustaceans, or food may be provided



Sea Bream. Edible fish found round the coasts of the British Isles
W. S. Berridge, F.Z.S.

in the form of small fragments of raw fish. See colour plate facing p. 7404; Animal.

Sea Bass (*Morone labrax*). Fish of the family Serranidae, native of S.W. Europe and the Mediterranean, extending to S. England and Eire, and occasionally found farther N. It is a fine fish, 2 ft. or more in length, and weighing 15 lb. The back is bluish grey, paling to silver on the sides and white beneath. The body is compressed, not so deep as in the related perches, and the upper outline straighter. The first dorsal fin has eight strong spiny rays. The fish spends the winter in the deep sea, but in May seeks shallower water for spawning, retiring again in Oct. or Nov. The eggs are buoyant (pelagic). Young bass frequent harbours and ascend rivers, feeding upon the smaller fishes and crustaceans. The flesh is esteemed for food by some; others consider it too coarse, and the fisherfolk in Cornwall reject it on account of the bass's predilection for feeding at the outlet of sewers. The stone bass (*Polyprion americanus*) is a shorter, deeper-bodied fish with the first dorsal fin long and low. It inhabits the deep waters of the tropical parts of the Atlantic and Pacific, whence it migrates to Great Britain. These migrants are about 18 ins. long and as many pounds in weight; but in the Mediterranean they have been recorded up to 1 cwt. See Bass.

Seaborg, GLENN THEODORE (b. 1912). American chemist. He was educated at California university, and at the end of his student career was taken on the research staff, becoming professor of chemistry in 1945. During the Second Great War Seaborg, who had already done brilliant work on nuclear chemistry, joined the team of scientists experimenting with plutonium (*q.v.*) at Chicago university. He was the first to identify americium and curium, two other elements artificially

made by radio-activity. See Atomic Bomb.

Sea Bream (*Pagellus centrodontus*). Marine fish of the family Sparidae. A native of the Mediterranean and the North Sea, it occurs in coastal waters all around the British Isles, especially on the S.W. With a deep, thick body and high dorsal fin, it presents a superficial resemblance to the fresh-water perch. The upper parts are red and the sides and under parts silvery, with a conspicuous black spot above the gill-covers. The front teeth are formed for cutting and the side teeth for grinding. Food is principally sand-stars, brittle-stars, and small crabs. The young are known as chads. This is an admirable food-fish.

Sea Buckthorn OR SALLOW-THORN (*Hippophaë rhamnoides*). Small tree of the family Elaeagnaceae. A native of Europe and Asia, it has alternate, lance-shaped leaves, silvery on the underside and dull green above. The male and female flowers are on separate plants. They are very small and green; the males clustered, the females solitary. The latter are succeeded by small orange-coloured berries, made into preserves in some countries. Many branches harden into a long thorn.



Sea Buckthorn. Twig of leaves; right, the orange berries and thorns

Sea Cadet Corps. British voluntary organization for training boys for the Royal and Merchant navies. Established as the Navy League Boys' Brigade in 1899, it received Admiralty recognition in 1919, when it assumed its present title. Besides being a training organization, the corps is a youth

movement preparing boys for citizenship. Each unit is administered by a local committee, and capitation grants for each efficient cadet are paid to units by the Admiralty. Officers, generally ex-members of the navy or merchant service, are granted unpaid commissions in the R.N.V.R. The corps has 400 units and some 50,000 cadets, with h.q. at 37-41, Gracechurch Street, London, E.C.3.

Seacombe. This district in the English co. of Cheshire is part of the co. bor. of Wallasey (*q.v.*).

Sea Cucumber. Another name for trepang or Bêche de Mer (*q.v.*).

Sea Disturbance. Term applied to the effect of wind upon the surface of the sea. Details of the scale used for sea disturbance on the high seas, and the corresponding heights of waves, are given in the table below. See Gale.

Beaufort Number (wind)	Description of sea	Av. height of waves in ft.	Code Figure (sea)
0	Calm—glassy	—	0
1	Calm—rippled	$\frac{1}{2}$	1
2	Smooth wavelets	$\left\{ \frac{1}{2} \frac{3}{4} \right\}$	2
3	Slight	5	3
4	Moderate	9	4
5	Rough	14	5
6	Very rough	19	6
7	High	25	7
8	Very high	$\left\{ \frac{31}{37} \right\}$	8
9	*Phenomenal	$\left\{ \frac{45}{or more} \right\}$	9

**e.g.* at the centre of a hurricane

Sea Elephant. Alternative name for the Elephant Seal (*q.v.*).

Seaford. Urban dist. and sea-side resort of Sussex, England. It stands on the S. coast, 3 m. E. of Newhaven and 58 m. S. of London, with a rly. station. Beautifully situated on a bay sheltered by cliffs, it has golf links and other attractions. The chief building is the church of S. Leonard, mainly Perpendicular. Seaford was at one time a seaport, as here the Ouse formerly entered the sea. It was also a smuggling centre. It early became a borough, and retained its corporate rights until 1883. In 1824 and 1866 inroads of the sea did much damage, and continued attention is given to sea defence. In 1928 Seaford Head, a famous headland, was bought by the urban council. The town suffered air raids in the Second Great War. Pop. 9,232.

Seafort. Type of A.A. artillery position built offshore in the Thames estuary during the Second Great War to defend the estuary and keep the Port of London open by driving off German mine-laying aircraft. Of seven such forts four

were manned by the navy and three by the army. Each fort consisted of a 36 ft. square concrete gun platform 50 ft. above water and mounted on concrete piles. The platform carried one 3·7-in., three 40-mm., and six 20-mm. A.A. guns. See Flak.

Seaforth. Scottish sea loch. It is on the E. side of the island of Lewis-Harris in the Outer Hebrides, and forms part of the boundary between Lewis and Harris. Its length is 14 m.

Seaforth. Dist. of Lancashire, England, forming part of the urban dist. of Waterloo and Seaforth. It stands on the Mersey, 4 m. N. of Liverpool, and is a seaside resort served by an electric rly. The name is taken from the Scottish sea loch (v.s.). Pop. 14,736.

Seaforth Highlanders. Regiment of the British army. It was formed in 1881 by the amalgamation of the 72nd Foot (Duke of Albany's Highlanders) and the 73rd Foot (Ross-shire Buffs) which had been raised by the earl of Seaforth for service in the Seven Years' War (1756-63). Both regts. were disbanded at the end of the war, but the 72nd was re-formed in 1778 and the 73rd in 1793. The former saw its first active service in India, where both took part in the Mahratta War of 1803. For special gallantry at Assaye the



Seaforth Highlanders badge



Sea Heath. Small leaves and flowers of the salt marsh plant

72nd was granted a third colour. Both regiments fought in the Crimean War and the Indian Mutiny, and in the Afghan War accompanied Roberts on his march from Kabul to Kandahar.

On amalgamation the 72nd Foot became the 1st battalion and the 73rd the 2nd battalion of the new

regiment. In 1882 this was at Tel-el-Kebir, then joined the Chitral expedition of 1895, and in 1897 was back in the Sudan. In the S. African War the regiment incurred heavy losses, especially at Magersfontein. Twenty-six battalions were raised for service in the First Great War. In the Second Great War the Seaforth Highlanders served in Malaya, Burma, N. Africa, Sicily, and N.W. Europe. The regimental tartan is that of the Mackenzie clan, and the depot is at Fort George, Inverness-shire.

Seagull. The various kinds of gull are described under that heading.

Seaham. Seaport and urban dist. of Durham, England. It is 5 m. S. of Sunderland, with which there is rly. connexion. There are three collieries, and a modern harbour, from which coal is shipped. An old church, S. Mary's, contains a little Saxon work. Seaham was a village until the opening of the coal mines. About 1823 the marquess of Londonderry began work on one harbour here, and during the 19th century the place grew rapidly. On July 11, 1916, it was shelled by a German submarine. In the Seaham harbour div. in 1935 the former prime minister Ramsay MacDonald lost a remarkable election to Emanuel Shinwell. Pop. 26,000.

Sea Hare. Popular name for the marine gastropod molluscs of the genus *Aplysia*. They have the general appearance of broad slugs—with upstanding tentacles supposed to resemble the ears of a hare. The shell is small, flattened, and concealed by the mantle. One species (*A. punctata*) is common in shallow water around the British shores, and has the power of ejecting a purple fluid when disturbed.

Sea Heath (*Frankenia laevis*). Perennial herb of the family Frankeniaceae. A native of W. Europe, Africa, and Asia, it is found in salt marshes and plains. The downy stem leans upon the ground and sends up wiry jointed branches. The tiny, opposite leaves are oblong in shape, but do not appear so owing to the margins being rolled back from the sides. The small rosy flowers are produced singly in the forks of the branches. They are succeeded by a three-sided capsule.

Sea Holly or **Eryngo** (*Eryngium maritimum*). Peren-

nial herb of the family Umbelliferae. A native of sandy seashores on the Atlantic, Mediterranean, and Black Sea coasts, it has a stout, creeping and branching rootstock, and large roundish root leaves, cut into three lobes, with spiny teeth. The leaves are all stiff and leathery and of a glaucous tint. The bluish-white flowers are stalkless, so that instead of producing the umbels characteristic of the Umbelliferae, they have them massed in a dense head, with spiny bracts at the base. Under the name of Eryngos the roots were formerly candied.

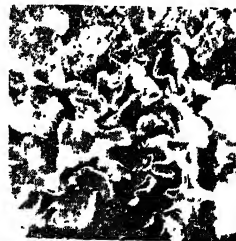
Sea Horse (*Hippocampus hippocampus*). Small fish (about 7 ins. long) related to the Pipe-fishes (q.v.). It is a native of the Atlantic and Mediterranean, occasionally appearing on the S.W. coasts of Great Britain and Eire, and rarely in the North Sea. Like the pipe-fishes it has a bony exterior, and the body is quadrangular, flattened from the sides. The large head ends in a long snout which has the small mouth at its extremity.

The fore half of the body is twice the depth of the hinder half; this, in conjunction with the bending of the head, produces a curious resemblance to the head and neck of a horse. The fish swims with the body vertical, motive power being provided by its solitary fin—the dorsal, which is small. There is no tail fin, but this end of the body is narrowed and coils around the seaweeds among which it lives. The males have a brood pouch (marsupium) on the lower side, in which they carry the eggs until hatched. The related Japanese seahorse (*Phyllopteryx equus*) has long ragged outgrowths from the body which mimic seaweeds.

Sea Kale (*Crambe maritima*). Perennial herb of the family Cruciferae, native of European sea coasts. It has a creeping rootstock, spreading branches, and large,



Sea Horse. The small bony fish W. S. Burridge, F.Z.S.



Sea Kale. Wild form of the edible seashore plant

wavy-edged leaves. The white flowers are produced in corymbs, succeeded by roundish one-seeded pods. Originally eaten in its wild state, for 200 years it has been cultivated in Great Britain as a food plant; the numerous young shoots in spring being forced and blanched. These are served up after the manner of asparagus. Plants may be raised from seed sown in March or April, thinned out 6 ins. apart, and in late autumn replanted in sandy soil, 2 or 3 ft. apart.

Seal (A.S. *seol*). Popular name for a group of marine carnivorous mammals, constituting the sub-order Pinnipedia or fin-footed animals. They have become adapted specially for marine life, the body being elongated and tapering from the shoulders to the tail, and covered with long, coarse hair. The limbs are converted into paddles, the greater part of their length hidden beneath the skin of the body, and the hands and feet fully webbed. In the true seals the hind limbs are united to the short tail and are useless for locomotion on land. Except in the sea lions there is no external ear. The one or two (almost invariably one) young are born on land, and are at first white. They are found in all seas except those of the tropics, but abound chiefly in the Arctic and Antarctic regions. The sub-order comprises three families: Phocidae or true seals, Otariidae or sea lions (*q.v.*), and Odobenidae or walrus (*q.v.*).

Several species of the true seals (Phocidae) visit the British coasts from time to time, and the common or harbour seal (*Phoca vitulina*) is a resident around Scotland, Ireland, Wales, and the N. and S.W. of England. It is between 4 ft. and 5 ft. long, yellow grey in colour, spotted with brown. It haunts the mouths of salmon rivers destroying many of the fish, and pursues them far up into fresh water; it sometimes inhabits inland lakes. The larger harp seal or Greenland seal (*P. groenlandica*), hunted extensively off Newfoundland, has been reported occasionally on the British coasts; its lighter coat is decorated above by two rugged black crescents extending from the shoulders to the thighs; the face also is black. The ringed seal (*P. foetida*), about 4½ ft. long, with the back marked by whitish ring-spots, is a very rare visitor to the Hebrides, N.E. Scotland, and E. England. It furnishes the Eskimos with food and clothing, and may have suggested the form of their huts, for it builds similar retreats in the ice.

The great grey seal (*Halichoerus grypus*), which visits the Hebrides, Argyllshire, the Irish coasts, and, more occasionally, England, is 8 ft. or 9 ft. long, yellow grey in colour, with darker spots and blotches. Its range is restricted to the Atlantic. The hooded or bladder-nose seal (*Cystophora cristata*), 8 ft. or 9 ft. long, is another rare visitor, whose headquarters are between Iceland and Greenland. It is dark bluish grey with lighter spots, and reaches a length of 10 ft. Its distinctive character is an inflatable sac about a foot long, on the face, which it distends for the purpose of terrifying aggressors. This species is more closely related to the elephant seal (*q.v.*). The only example in the Mediterranean is the monk seal (*Monachus albiventer*). Found only in the Antarctic are the leopard seal (*Stenorhynchus*), the crab-eating seal (*Lobodon*), Weddell's seal (*Leptonyx*), and Ross's seal (*Ommatophoca*).

Seals feed upon fishes, crustacea, and molluscs; occasionally upon birds. The thick blubber with which they are coated, like the whales, can be boiled down into oil, and for the sake of this product and their skins seals are persistently hunted. See Baffin Bay; illus. facing p. 7405.

Seal (Lat. *sigillum*, little sign or mark). Mass of wax, lead, or other substance, bearing a device or words impressed upon them by a die; also the die itself, often called a matrix. The latter is retained for exclusive use by one person or corporation for the purpose of authenticating documents, and preventing the unauthorised opening of envelopes, boxes, doors, etc. The die, usually of a hard stone or metal, is generally incised, and is often fitted to a finger ring, when it is called a signet.

Seals have been used from remote antiquity. Specimens belonging to the early Egyptian dynasties have been found, and also the stamps of royal seals on Assyrian clay records. In Rome the symbols often formed a pun on the bearer's name. In the Middle Ages seals were usually of a religious or heraldic character. Royal and ecclesiastical seals were usually large and elaborate, having both an obverse and reverse, in which the gold, silver, lead, or wax seal was moulded, a complete impression having ornamented front, back, and edges, a silken ribbon, cords or strip of parchment being embedded in it to facilitate attachment to a document. Seals of the 13th and 14th cents. were very fine.

In England, specimens of the royal state seals have been preserved from the time of Edward the Confessor, and form a valuable historical record. Besides the great seals, in the keeping of the chancellor of the realm, the kings had privy seals, smaller in size, and from the reign of James I special seals for various household and state depts. The great seals and most of the privy seals from the time of Richard I are armorial. See Anselm, S.; Chancellor; Edward the Confessor; Privy Seal; consult English Seals, J. H. Bloom, 1906; Seals, W. de G. Birch, 1907.

Seal. Name of a British submarine, 1,520 tons, complement 55, built in 1938. She was captured by the Germans May 5, 1940, while mine-laying in the Kattegat. Her commander, Lt.-Cdr. R. C. Laisdale, R.N., and junior officer, Lt. T. A. Beet, R.N., tried by court-martial at Portsmouth April 9-11, 1946, for failure to prevent the capture of the ship, were honourably acquitted.

Sea Lavender (*Statice*). Genus of mostly perennial herbs of the



Sea Lavender. Flower spikes of shore plant

family Plumbaginaceae. They are natives of sea-shores and salt districts of temperate regions. The leaves spring directly from the stout root-stock, and the small, abundant flowers are

borne on tall, branching stems. The calyx is of a tough, parchmenty character which retains its form long after the seeds have been shed. Many species are grown for the purpose of drying the flowers for winter decoration. The name is derived from the blue-purple colour of the common European species (*S. limonium*).

Sealed Orders. In time of war, or when it is desired that a ship's destination should not be generally known, the captain's orders are handed to him in a sealed envelope, which he is instructed not to open until the vessel has reached a given place at sea. In such circumstances the ship is said to be "sailing under sealed orders."

Sea Level. The surface which the sea would assume were it stag-

nant and without fluctuations due to waves, swell, tides, etc. Although there is considerable variation in the amplitudes of the oscillations from place to place and from time to time, it is believed that the mean sea level is virtually constant at a given place in the open ocean. The standard datum for M.S.L. around the coasts of the U.K. is at Newlyn, Cornwall.

Sea Lily. For this class of the Echinodermata, see Feather Star.

Sealing Wax. Composition for fastening letters, parcels, etc., and taking impressions of seals on documents. In the 16th century it was made of beeswax, turpentine, and colouring matter, and was known as Spanish wax, having been imported into Europe through Spain. It is now made of shellac (*g.v.*) and Venice turpentine, coloured with vermilion, ivory-black, or other colours. A coarser sealing wax, made of resin with a proportion of beeswax, is used for sealing corks into bottles.

Sea Lion (Ger. *Seelöwe*). Code name used by the Germans for their plan of operations for the invasion of England in 1940. Discovered in Berlin, and published by the Allies, Sept. 26, 1945, it is described under Invasion.

Sea Lion or Fur Seal (*Otariidae*). Family of seals, natives of the temperate and Arctic regions of both hemispheres. They are distinguished from the true seal (*g.v.*) by having a more distinct neck, by the muzzle being more pointed with the nostrils at its extremity instead of on the upper surface, by having small external ears, and a close, woolly fur under the long coarse hairs. In addition, the hind limbs are free from the tail and can be turned forward so as to be used on land, enabling the creatures to get over the ground speedily, though awkwardly.

They are less exclusively aquatic than the true seals, and on land associate often in great numbers, especially in the breeding season, when every old male herds from 15 to 20 females in his harem. The younger males (under six years) and females congregate in thousands on separate "hauling grounds" apart from the "rookeries" or breeding grounds. Fierce conflicts take place between the old bulls for the possession of cows. Roughly speaking, the sea lions may be said to be intermediate between the true seals and the land carnivora. Among the best known species is the southern sea lion (*Otaria jubata*) of the Falklands and S. Pacific, the Californian sea

lion (*O. gillespiei*) and the northern fur-seal (*O. ursinus*) of Alaska, Bering Sea, and Labrador. The last named is the chief source of the highly-prized sealskin of commerce, and has been the cause of serious international disputes. Fully developed males are from 6½ to 7½ ft. in length and weigh from 400 to 600 lb., with a thick deposit of blubber around the neck and shoulders. During the three months of the breeding season they take no food, and they return to the water thin and weak. An account of this species is given in An Arctic Province: Alaska and the Seal Islands, by H. W. Elliott, 1886. The sea lion of the menageries is the black Californian sea lion (*Zalophus californianus*). See illus. facing p. 7405.

Sea Lord. Title of five officials of the British board of Admiralty. Whereas the first lord of the Admiralty directs policy, and is a civilian appointment held by a member of the govt. of the day, the sea lords are naval officers exercising administrative control over the affairs of the Royal Navy. Their full titles are: first sea lord and chief of naval staff; second sea lord and chief of naval personnel; third sea lord and controller; fourth sea lord and chief of supplies and transport; fifth sea lord and deputy chief of naval staff (air).

Sea Lyme-grass (*Elymus arenarius*). Tall, coarse, perennial grass of the family Gramineae. It is a native of Europe, N. Asia, and N. America. It has a stout, creeping rootstock which sends out runners and helps to bind the loose sand among which it grows. The stout stems are 3 to 6 ft. high, and the wax-coated leaves rigid and sharp-pointed. The flowering spikelets are in two compressed rows.

Seam. In mining, a layer of mineral which has been deposited originally in a horizontal position and usually more

or less by the aid of water, as distinguishing a vein or lode, which cuts across seams or strata. A seam may be only an inch or so in thickness, or 4 ft. to 5 ft., as in some coal mines, or 100 ft. or more, as in some rock salt and iron ore deposits, though such thick deposits are usually described as beds rather than seams. See Coal.

Seaman. Term for a sailor. More strictly it is used for one who is employed to navigate a ship at sea, but is below the rank of an officer. In the U.K. the law relating to the employment of British seamen is contained in the Merchant Shipping Acts. A seaman is any person (except a master, pilot, or apprentice) employed or engaged in any capacity on board any ship. The Merchant Shipping Acts have considerably improved the conditions of life in the merchant service. A seaman must be engaged on an agreement in a form approved by the board of trade, and this agreement must set out plainly the conditions of service, nature and length or extent of the voyage, the capacity in which the seaman is to serve, a scale of provisions to be furnished, etc.

A foreign-going seaman must be discharged and paid in the presence of a board of trade superintendent, and the master of the ship must give him a discharge certificate. When the sailor leaves his foreign-going ship at the end of his engagement, he is entitled to be paid £2, and the balance within two clear days. A home seaman is not entitled to the £2 immediately. Advance notes are restricted to one month's pay; and a sailor who wishes his pay to be allotted from time to time, say to his wife, must have it stated in his agreement. No allotment can be made except to a near relative or to a savings-bank. A seaman may not by any agreement forfeit his lien on the ship for his wages, nor forgo his right to wages in the event of the ship's being lost; and he is entitled to wages up to date if the ship is wrecked or lost, or if he has to be put ashore for sickness, but if he neglects or refuses to work for a time he forfeits his wages for that time. There are many other provisions protecting the seaman's wages. A master can no longer discharge a seaman at a foreign port and leave him stranded. He must provide for the man's return to the port at which he signed on.

Medical attendance must be provided in case of injury or sickness; and adequate and proper food must be supplied. Speaking generally



Sea Lyme-grass. Left, stem and leaves; right, flowering spikelet



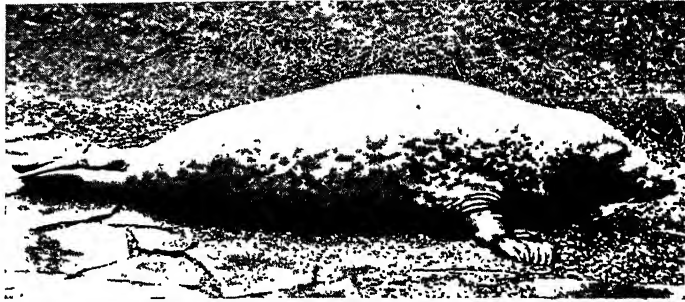
1, 2, and 7 Beadlet (*Actinia equina*) 3 *Actinodendron* 11 Plumose Anemone (*Metridium senhousii*),
australiac (a coral) 4 *Heterodactyla hamprichii* 12 and 13 Opellet (*Actinometra sulcata*) 14 *Corallia*
 5 Vestlet (*Corallium mullerianum*) 6 *Discosoma* 15 and 16 *Dahlia Warblet* (*Urticina felina*),
haddonii 8 *Heterodactyla hyalina* 9 Gasplet 17 Deciplet (*Bolocera lucida*) 18 Arrow Muzzlet
 (*Stomphia churchiana*) 10 *Dahlia Warblet* (*Urticina* (*Peachia*) *herdmani*)

SEA ANEMONES: BEAUTIFULLY COLOURED POLYPS OF THE ORDER ANTHOZOA

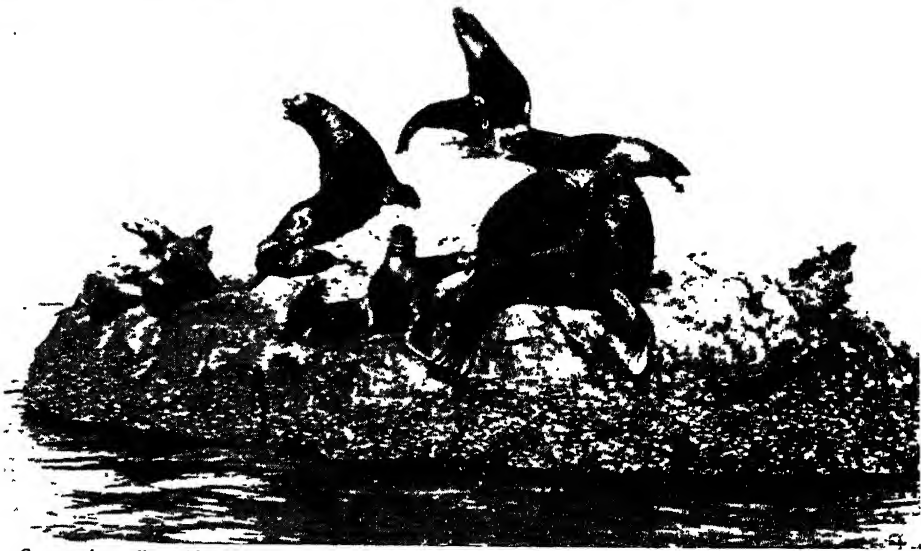


Monk seal (*Monachus al-biener*), the only seal found in Mediterranean waters - it has been found off the African coast as far south as Madeira

Common or harbour seal (*Phocastulina*), found on the coasts of the British Isles. It is 4 ft. to 5 ft. long, yellow grey with brown spots



Young specimen of the hooded or bladder-nosed seal (*Cystophora cristata*), found between Iceland and Greenland. Bluish grey and may be as long as 10 ft.



Group of sea lions (*Otaria gillespiei*), basking on rocks at Santa Catalina Is., off California - Sea lions, sometimes called fur seals, are distinguished from the true seal by external ears and the ability to move more freely on land

SEAL AND SEA LION: VARIETIES OF THESE CARNIVOROUS MARINE MAMMALS
See text pp. 7403-04

ally, the seaman on British ships is now, as far as legislation can accomplish it, saved from being fleeced or ill-treated. On the other hand, a seaman who does not obey lawful orders, or who refuses to return to his ship, is liable to punishment, and even to be compelled to complete the voyage. See Merchant Navy; Navigation.

Seaman, Sir OWEN (1861-1936). British journalist and poet. Educated at Shrewsbury and Clare College,



Sir Owen Seaman,
British writer
Mills

Cambridge, he was Porson prizeman in 1882, first class in the classical tripos, and captain of Clare boats, in 1883. Appointed a master of Rossall School in 1884, he was professor of literature at Durham College of Science, Newcastle-upon-Tyne, in 1890. While an undergraduate he collaborated with Lancelot Speed and Horace Monro in a volume of satire on university life, *Paulopostprandials*.

In 1894 appeared his first contribution to *Punch*, a parody of Kipling. In 1897 he joined the staff of that periodical, becoming assistant editor in 1902, and editor from 1906 to 1932. A barrister of the Inner Temple in 1897 and hon. fellow of Clare in 1907, he was knighted in 1914, and created a baronet in 1933.

Seaman published many works of satire and light verse, but was most generally known for topical verses which appeared in *Punch* almost weekly for many years over the signature "O.S." During the early days of the First Great War these were widely quoted, and many spoke of Seaman as an unofficial poet laureate. He died Feb. 2, 1936.

Sea Milkwort OR **BLACK SALT-WORT** (*Glaux maritima*). Perennial herb of the family Primulaceae. It is a native of Europe, Asia, and N.

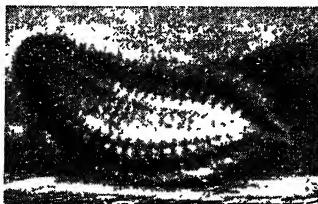
America, growing on seashores and estuaries and in inland salt districts. It has a fleshy, creeping rootstock from which a number of short stems arise, clothed with oval-oblong, stalkless, fleshy leaves in pairs. The flowers are produced in the axils of the upper leaves, and



Sea Milkwort, or Black Saltwort. Leaves and flowers

have no petals, the coloured part being the pink sepals.

Sea Mouse (*Aphrodite aculeata*). Popular name for an annelid worm of the order Polychaeta (many bristled). It is fairly common



Sea Mouse. Underside of the annelid worm, common about British shores

around the British shores, living in the sand below tide mark, and is often cast up after storms. It varies from 3 to 5 ins. in length, and has an oval body covered above with broad plates and iridescent bristles, and below bears many pairs of "feet" ending in bunches of bristles.

Séance (Fr., a sitting). Term applied, especially by spiritualists, to a gathering for the purpose of inducing psychical phenomena, particularly communication with a disembodied intelligence. See Planchette; Psychical Research; Spiritualism.

Sea Otter (*Lutra lutris*). Carnivorous mammal, related to the true otters, but placed in a separate genus. It differs in the number and form of the cheek teeth, and is a much bulkier and heavier animal, with a body about 3 ft. long, flipper-like hind feet, and a rather short tail. Its dark brown fur is one of the

most valuable in the trade, a fine specimen having realized £200 in the European market. The sea otter ranges the coasts on both sides of the N. Pacific, being chiefly found about Alaska and the Aleutian Islands. A strong swimmer, it has been found 15 miles from land. Its food consists of molluscs, sea urchins, and crabs. It is not gregarious; more than two specimens are rarely seen together.

Sea Pen. Popular term applied to a family (Pennatulidae) of alcyonarian corals. In the general form of the stock of polyps has a resemblance to a feather or quill. The term has also been used for the rudimentary shell in some of the cephalopods, as in the genus *Loligo*.

Sea Perch OR **COMBER** (*Serranus cabrilla*). Food fish related to the sea bass (*q.v.*). A native of the E. Atlantic, Mediterranean, and Red Sea, migrating to S. England, it is hermaphrodite in sex, and measures about 10 ins. in length, the body compressed and deep, of a pale red colour with two or three blue or whitish waved lines running



Sea Perch. A species of bass
Cambridge Natural History (Macmillan)

from head to tail along the sides. The jaws, of which the lower is the longer, are well furnished with irregular, incurved teeth. The two dorsal fins are united, but are distinguished by the stouter spines of the fore-portion. It is constantly



Sea Otter of the Northern Pacific Ocean

captured in crab-pots, which it enters in quest of the bait, and as a rule it is used by the crabbers for baiting them afresh.

Seaplane. Aeroplane capable of taking off from, and alighting on, water. The term embraces floatplanes and flying-boats. The floatplane resembles the landplane, but its wheeled undercarriage is replaced by one or more large floats (U.S., pontoons), normally with additional float support under the wing-tips and/or tail unit. The flying-boat (*q.v.*), the commoner class since the First Great War, is in general a larger aircraft, and is supported on the water by

a boat-like hull, again usually with wing-tip floats. Amphibians (capable of flying from land or water) may be of either type.

Seaplanes are heavier than comparable landplanes, and this detracts from speed and performance generally, but in many parts of the world operation from a stretch of water is both more economic and more efficient than providing costly runways for land aircraft. The characteristic deep hull form of many flying-boats also allows a heavy payload and a high degree of comfort for passengers.

Although other nations—the U.S.A. with the Boeing and Martin Clipper classes and the wartime Catalina, France with the Latécoère and other flying-boats, and Italy with several successful floatplanes—have made contributions, British constructors such as Short Brothers, Blackburn, Vickers-Supermarine, and Saunders-Roe have been outstanding in developing marine aircraft for peace and war. The contest for the Schneider Trophy (*q.v.*) for seaplanes only was won outright in 1931 by the Supermarine S6 floatplane. See *Aeroplane*.

Sea Power Phrase meaning the command of the sea, first popularised by A. T. Mahan, of the U.S. navy, in a series of works, of which the first was published in 1890, pointing out the decisive influence which sea power has exercised on the course of wars and the events of history. There was nothing new in this. The importance of sea power had been understood at a very early date; the mysterious Cretan empire under Minos had been based on a command of the Mediterranean; the defeat of the Persians by the Greeks (490–479 B.C.), and of the Athenians by the Spartans (431–405 B.C.), was known to have been achieved by sea power, which very term in its Greek form occurs in the contemporary Greek historian Thucydides.

The triumph of Rome over Carthage was mainly due to the Roman preponderance at sea, which exercised a decisive influence in the second Punic War, notwithstanding Hannibal's victories on land. In the Middle Ages and later, the command of the Mediterranean by the Venetians was the source of their power and wealth. The importance of sea power was ever present in the minds of the rulers of Tudor England, who had the signal example of it in the defeat of the Spanish Armada, 1588. It was illustrated in the wars with Holland under the Commonwealth and

Charles II. British command of the sea was mainly responsible for the defeat of the Bourbon states, France and Spain, in the wars of the 17th and 18th centuries; a disputed command of the sea, through the intervention of the French and Spanish navies during the British struggle with the 13 colonies in America, brought the British defeat and the independence of the United States. In the wars of the French Revolution, 1793–1815, British sea power was once more the decisive factor, and the blockade which it enforced was the deeper cause of Napoleon's overthrow.

The value of Mahan's works lay in this, that they brought out facts which had almost been forgotten by 1890. Mahan laid down certain principles of sea power; the control of the sea "does not imply that an enemy's single ships or small squadrons cannot steal out of port, cross more or less frequented tracts of ocean, make harassing descents upon unprotected points." It is achieved by defeating or blockading in their ports the main forces of the enemy. To secure such a result, he taught that naval force should not shun battle or seek "ulterior objects" — to which practice he ascribed the failure of the French. Destruction of the enemy's commerce by raiders and commerce-destroyers would never be decisive so long as the main naval forces of that enemy remained intact. Ships, colonies, well-placed bases, and a great commerce he regarded as necessary conditions of sea power; and he pointed out that an island empire with possessions scattered over the globe, sundered by sea, could not survive attack if it was not superior to the assailant in naval force.

In all recent conflicts down to the Second Great War the truth of these principles was emphasised by results. In the American Civil War (1861–65) the sea power of the North paralysed the Confederacy. In the China-Japan conflict of 1894–95 the decisive battle was that in which the Chinese fleet was defeated at the Yalu. In the Spanish-American war of 1898 Cuba was lost to Spain when the Spanish fleet was destroyed at Santiago; the Philippines were lost when another U.S. fleet defeated the Spaniards in the battle of Manila. In the Russo-Japanese War of 1904–05, command of the sea enabled the Japanese to invade Manchuria and take Port Arthur; the battle of Tsushima, 1905, in which a large Russian fleet was de-

stroyed, led Russia immediately to decide on peace. This war was important as illustrating the difficulties of a navy which possesses no chain of fuelling stations and bases, and which has to undertake operations at an enormous distance. The Russian fleet, to reach the Japanese, had to steam 10,000 miles, and when it arrived was foul and in bad fighting condition.

The First Great War saw the use of sea power on a vast scale; to the British blockade the Germans mainly attribute their defeat. The effect of this blockade was far-reaching; it deprived them of raw materials, such as rubber and copper, which they could not replace; food supplies, which their depleted man-power could not grow; ammunition and weapons, which the Allies could freely import, thereby setting free large numbers of men for the field; and of the power of exporting German products, such as chemicals, and thereby obtaining gold. It enabled the Allies to move enormous forces from Canada, Australia, and the U.S.A. Admittedly there was a point in the war when the Allies commanded the surface of the sea—from which they had driven all the German surface ships—but were unable to control its depths, which the German U-boats used as their means of egress.

Again in the Second Great War the Germans did their utmost to overcome Allied superiority at sea by submarine attack on commerce. Once this menace had been removed, the pressure exerted by sea power, and the ability which it confers on the possessor to move troops and supplies freely, inevitably led to victory. See *Air Power*; *Navy*.

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Search. In general, the act of examining to find some person or object. The term is applied to the examination of cargo or baggage for customs purposes, and to the investigation of public records for legal purposes. In international law, the right of search is the right by which a commissioned warship of a belligerent state can stop and examine a merchant vessel not actually in neutral waters for contraband of war.

A constable has a right to search a prisoner who is violent, if this is necessary for the protection of prisoner or constable. He may also search a prisoner if the latter is likely to have any stolen property or articles. When a court fines a person, it may order him to be searched and any money found may be taken to pay the fine. An unauthorised search is a trespass to the person. No premises may be searched without a search warrant, which is an order or written authority given by a magistrate. In emergency, *e.g.* in connexion with suspected offences against the Official Secrets Acts, a police superintendent may give a written order having the same effect as a search warrant.

Searchlight. Apparatus for projecting a powerful beam of light in any direction. Searchlights are used in lighthouses, ships, fortresses, and for military operations in the field to project the light of an electric arc. The body of a searchlight consists of a short metal cylinder strengthened at both ends by angle-iron rings. A silvered mirror of parabolic shape is attached to the back ring and protected by a removable cover. The front ring carries a door glazed with narrow vertical strips of plain glass, which are free to expand independently in all directions. At the top is an opening, covered by a light-tight hood, to permit hot air to escape; similar openings at the bottom admit cold air. In the sides are cleaning doors and small windows through which the arc may be observed.

The lamp mechanism, fastened to the bottom of the body, has two long arms projecting through a horizontal slit to hold two carbon rods in the axial line of the cylinder. The positive carbon in which the luminous crater is formed points at the centre of the mirror, and is so adjusted that the crater lies exactly in the reflectors' focus. At their bases the arms are controlled by magnets which automatically separate the carbons when current is first turned on and "strike" the arc, and keep them the correct distance apart as the ends waste away.

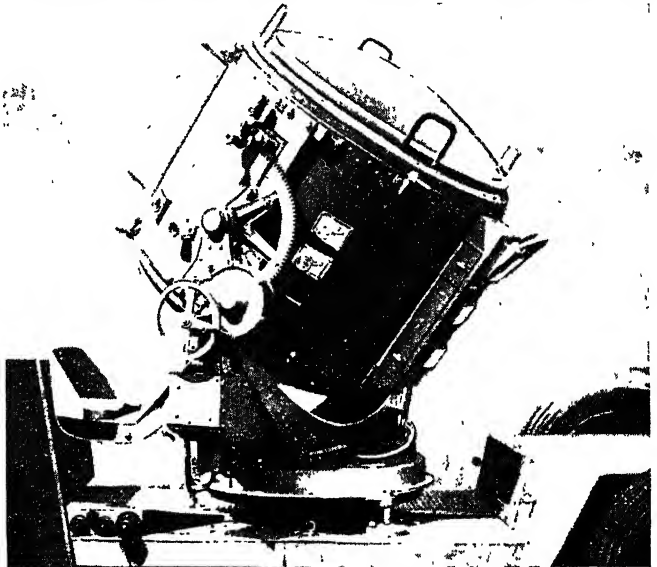
Body and lamp are balanced on horizontal trunnions at the sides bearing on arms attached to a circular table, which is revolved easily by hand or gearing on a ring of balls in the upper face of the base. Current is conveyed to the lamp through insulated slip-rings in the base with which

brushes on the table make contact. Insulated wires run from the brushes up the arms almost to the trunnions, and thence to the terminals of the lamp, to allow the lamp to be moved freely through about 90° of a vertical circle.

Under some conditions moderate illumination over a wide angle is preferable to a concentrated narrow shaft of light. This may be obtained by means of a "disperser," fitted to the front and composed of a number of narrow, vertical lenses, each having the same section from top to bottom,

passed to the next light, and so on, to illuminate it for guns or aircraft. British military searchlights are operated by battalions of Royal Engineers and are mobile, the power for the light being supplied by a generator. Searchlights on warships light up small surface targets at night. On fortifications they illuminate areas liable to sudden attack.

In the Second Great War a small "invisible" searchlight was developed for use by snipers. It sent out a beam of infra-red rays, invisible to the naked eye, which



Searchlight. Type used for aircraft illumination. It is elevated and traversed by electric motors, and mounted on a trailer

Courtesy of the London Electric Firm

but curving from the centre line towards the edges. The rays are scattered laterally only. The double disperser has two parallel sets of lenses, one behind the other.

The diameter of searchlights ranges from 15 to 60 ins., and the focal length from 7 to 25 ins. Direct current of 40-60 volts is used at 20 to 150 amperes, according to the size. The candle-power of the largest projectors is 160,000,000 approx.

Searchlights are used by ships to light up intricate channels when navigating at night, but their principal application is in warfare, particularly for A.A. work. A.A. searchlights are ranged on their target by means of sound locators synchronised with the light's turntable, the light being centred through a ring on the locator. When the target is picked up by searchlight it is

showed the ground to a maximum distance of 80 yds. when viewed through a telescope sensitive to infra-red rays.

Seascale. Seaside village of Cumberland, England, notable for its sandy beach. It is 12 m. W. from Sca Fell Pike, and has a rly. station. The buildings include a late 19th century church in Norman style, with some fine work in glass and stone, and a 17th century manor house. A mile from Seascale a stone marks the site of a Stone Age circle.

Seascape. In art, a picture of the sea, usually with shipping. Originally written *seaslip*. Seascape as a branch of painting first attained importance in the hands of W. Van der Velde, Jakob Bakhuysen, and other Dutch masters of the 17th century, and was popularised in England by Turner. Among later seascape artists have

been C. Napier Hemy, H. Mesdag, Julius Olsson, and W. R. Wyllie.

Sea Scout. Member of the nautical section of the boy scout movement. Sea scouts have the same basic training as ordinary scouts, but with the addition of specialised marine activities and proficiency tests. *See* Boy Scouts.

Sea Serpent. Supposed marine animal. Stories of animals of immense size inhabiting the ocean

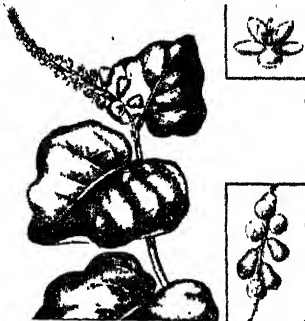
subjects to fish and navigate there and to pass over it; exceptionally a stretch of foreshore may be private property, either as part of a manor or as a grant from the crown. More loosely, the seashore is the marginal area between the land and the sea, and in this sense includes the land covered by exceptionally high tides.

Shores are continuously affected by the denuding and transporting

shore birds in temperate latitudes, and penguins live on the margins of the frozen oceans. *See* Coast.

Sea-Sickness. Form of illness due to the motion of a ship. Air-sickness and travel sickness are similar terms appropriate when the journey is by aircraft or train. The symptoms are vertigo and nausea, often followed by vomiting and physical prostration. Sufferers about to travel should abstain from heavy meals for some days before the journey, avoiding milk, chocolate, pork, and foods which make heavy work for the liver. Various drugs have a sedative effect upon the nervous system and lessen the likelihood of sickness. The most useful are phenobarbitone and derivatives of belladonna, which should be started in small doses two days before the journey. A firm belt, an eye bandage, and ear plugs all help to diminish the sense of motion.

Seaside Grape (*Coccoloba uvifera*). Small evergreen tree of the family Polygonaceae, native of the West Indies. It attains a height of about 20 ft., and has roundish heart-shaped, leathery leaves, and

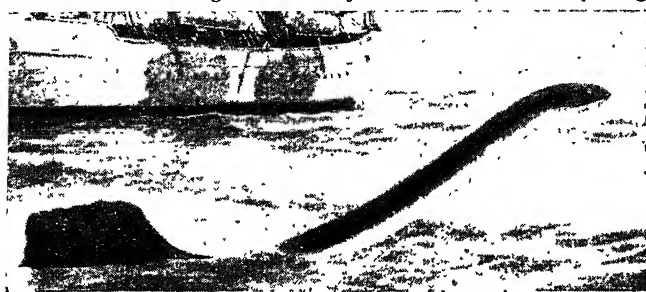


Seaside Grape. Leaves and flower-spike of the tree; inset, below, fruit; above, single flower

fragrant white flowers. The floral envelope, or perianth, becomes pulpy, of a violet colour, and acid flavour. The whole plant is astringent, and an extract may be used as a substitute for kino.

Sea Slug. Name popularly applied to various marine gastropod molluscs in which the shell is either absent or is concealed under the mantle. For these the term is not inappropriate; but it is erroneous when applied to the holothurian echinoderms, e.g. the bêche de mer, which belong to a different phylum of the animal kingdom from the molluscs. *See* Mollusca

Sea Snake (*Hydrophidae*). Family of aquatic reptiles. It includes 10 genera and about 50 species, natives of the tropical portions of the Indian and Pacific



Sea Serpent. Marine creature sighted from the Earl of Crawford's yacht Valhalla, in the South Atlantic Ocean, off Para, Dec. 7, 1905

From a drawing by M. J. Nicoll, a naturalist on board

have been told since remote times, but the first historical account of the sea serpent occurs in the 16th century, Olaus Magnus's History of Serpents describing a monster 200 ft. long and 20 ft. in circumference. Thereafter the sea serpent became a common sailor's story. Some zoologists believe that there exists in the ocean some marine reptile thought to have become extinct thousands of years ago; against this theory is the fact that the sea serpents alleged to have been observed differ too greatly in appearance to belong to any particular species. Moreover no remains have ever been discovered.

In every instance where it has been possible to ascertain facts, the alleged sea serpent has proved to be something else—e.g. porpoises swimming in Indian file; a mass of seaweed half awash; ribbon or oar fish, which sometimes attain a length of 30 ft.; sea lions breaking surface for breath; or giant squids, which are sometimes 50 ft. in length. *Consult* The Case For The Sea Serpent, R. T. Gould, 1930.

Sea Shanty. Type of song otherwise spelt chanty and so entered in this Encyclopedia.

Seashore or **FORESHORE.** By English law, that portion of the land between the limits of an average high and an average low tide. High and low water marks are found by taking ordinary tides and not spring or neap tides. All foreshore belongs normally to the crown, subject to the rights of all

activities of the sea, and the slow, secular movements of the earth's crust, whereby the relative level of land and water is disturbed. Waves, currents, and tides continuously fret the shore, and redistribute the accumulations of detritus brought down by rivers or collapsed from coastal cliffs; sand or shingle banks may arise and transform a wide estuary into a brackish lagoon, bounded seawards by a straight shore, and thus miles of land once seashore are removed from tidal activities.

Low shores are often characterised by salt marshes in temperate lands, or by mangrove swamps in tropical countries. Growths of such plants and the more ubiquitous seaweed tend to be circumscribed within tidal limits, since the plants require a sea-water habitat and yet cannot exist under deep sea water.



Sea Slug. *Elaysia viridis*, the green sea slug of British waters

Animal life is abundant. Insects in the sands, starfish, sea anemones, shellfish are typical of British shores. On the fringes of the warm oceans the shores are dominated by the work of the coral polyp. Sandpipers, plovers, and curlews are

Oceans. A single exception to their marine habit is afforded by a species found in freshwater lakes of the New World. They vary in length between 3 and 8 ft., and are mostly brightly coloured, often in contrasting rings of black and white, olive and yellow, green, etc.



Sea Snake of the Bay of Bengal and Malay Archipelago

Drawn from the Cambridge Natural History (Macmillan & Co.)

Instead of the rounded or flattened underside of the land snakes, these have the belly keeled like many fishes, and the tail compressed to serve as a paddle, though it can be used also for taking hold of coral or seaweed. The small scales do not overlap. The small head is pointed; the eyes, small with round pupils, are almost useless when the snake is on land.

The poison from their permanently erected short fangs is so virulent that the muscles of a bitten fish are relaxed instantly, so that it can be swallowed without danger from erected spines. Owing to the great development of their lungs and the possession of a valve to the nostrils they are able to remain under water for considerable periods. Their movements on land are awkward. All the species produce living young.

Season (Lat. *satio*, a sowing). Period into which the year is divided by the sun's changes in declination. Near the equator, temperature is so evenly distributed that the year is usually divided into the wet and dry seasons. In temperate latitudes the year is divided into four seasons, spring, summer, autumn, and winter. This is due to the fact that during the year the height of the sun and the temperature of the air vary considerably. In the British Isles the seasons according to the "farmer's year" are: winter (Dec.-Feb.) for tilling; spring (March-May) for sowing and early growth; summer (June-Aug.) for maturing and harvesting, and

autumn (Sept.-Nov.) for cleaning and preparing.

The cause of the varying height of the sun is the tilting of the earth's axis. On June 21 the position of the earth with regard to the sun is such that the north pole is tilted towards the sun, causing the latter to appear higher in the sky in the northern hemisphere than in the southern, and to be overhead at the tropic of Cancer. On Sept. 23 the sun is overhead at noon at the equator. By Dec. 21 the earth in its journey round the sun has reached a position opposite to that of June 21. Although it is then 3,000,000 miles nearer the sun than in June, the fact that the north pole is now tilted away from the sun gives winter in the northern hemisphere and summer in the southern. By March 21, the vernal equinox, the earth and the sun are in the same relative position as on Sept. 23, the autumnal equinox. There is a lag behind the sun in temperature variations of the seasons, so that the hottest month is July and the coldest Jan. in northern latitudes, and vice versa in southern latitudes. See also Close Time.

Season Ticket. Ticket purchased by a single payment, permitting the holder (whose name is usually written on the ticket) to use



Sea Trout. Silvery fish regarded as a migratory form of the brown trout
W. S. Berridge, F.Z.S.

a specified stretch of railway, etc., for a certain time—week, month, quarter, or year—irrespective of the number of journeys made. In U.S.A. a railway season-ticket holder is called a commuter, because he has commuted his fares by taking a commutation ticket. Season tickets are also issued for a series of concerts and other events.

Sea Squirt. Popular name for ascidians, the first order of the class Tunicata. See Animal colour plate; Ascidians.

Seaton. Urban dist. and watering-place of Devon, England. It stands on the Axe, 7 m. by rly. S.W. of Axminster. There are hotels, bathing, and golf links. Pop. est. 2,500.

Seaton, JOHN COLBORNE, 1ST BARON (1778-1863). British soldier. Born at Lyndhurst, Feb. 16,

1778, and educated at Christ's Hospital, he entered the army in 1794, and in 1809 joined the forces in Spain. During the Peninsular War he was present at Busaco, Albuera, and at Ciudad Rodrigo. In 1814 he was at Toulouse, and at Waterloo he commanded the 52nd Foot. In 1838, as lieut.-governor of Upper Canada, Colborne crushed the Canadian revolt. For this service he became Baron Seaton, and in 1860 field-marshal. He died at Torquay, April 17, 1863. In 1933 James Ulysses Graham Colborne-Vivian (b. April 20, 1863) inherited the title as 4th baron.

Seaton Carew. Parish within the co. bor. of West Hartlepool, Durham, England. It has a rly. station, fine level sands, and is a sea-bathing resort. Pop. est. 2,500.

Sea Trout or **SALMON TROUT.** British fish. Formerly considered a distinct species, it is now more generally regarded as an anadromous or migratory form. It is placed in the same species as the brown trout, *Salmo trutta*. In habits

it is much like the salmon (*q.v.*), going to the sea to feed, where it gets a silvery coat and attains a length of 3 ft., returning to fresh water for breeding, spawning from Sept. to Nov., and going back to the sea as

a kelt. It is found in the N.E. Atlantic, Mediterranean, and Caspian Sea.

Seattle. Largest city of Washington State, U.S.A., the co. seat of King co. The nearest port to the Orient and Alaska, it is the commercial, industrial, and financial centre of the Pacific North West, and the headquarters of federal government services there. It is the largest city of its age in the world, having been founded as late as 1852, and claims to be the healthiest. Seattle is beautifully situated on a neck of land, with the snow-capped Olympic Mts. and Puget Sound on the W., and Lake Washington and the Cascade Mts. on the E. and S.E. It lies 865 m. N. of San Francisco by water; 185 m. N. of Portland by rly. It is the terminus of trans-continental rlys.,



1st Baron Seaton, British soldier
After J. Richmond



Seattle, Washington State, U.S.A. Business centre of the city looking across Puget Sound to the Olympic Mountains

of airlines, and the home port of steamship fleets.

The fine salt-water outer harbour is connected by a ship canal with Lake Washington through Lake Union, in the heart of the city. The port ranked twelfth in the country in 1945 by volume of cargo handled. Most of the gold from Alaska and the Yukon is brought here. Exports include lumber, flour, canned fish, machinery, scrap metal, copper, agricultural and dairy products, livestock and fruit. Seattle has long been a great lumbering centre. A Boeing aircraft plant turns out Clipper flying-boats here. Factories are in the Puget Sound area. Cheap electric current and hydro-electric power are plentiful.

There are 3 sq. m. of parks and recreation grounds and a system of scenic boulevards. The university of Washington has a campus which borders on Lakes Union and Washington. At Bremerton, 15 m. S.W., is the nation's largest graving dock for the construction of battleships. There is a naval air station on Lake Washington. Seattle was little more than a lumber camp and fishing village until news of the Klondike gold discovery arrived in 1897. Its Oriental trade began to develop about the same time. The city has seen labour troubles, including massacres and general strikes. Citizens have the rights of initiative (*q.v.*) and referendum. Pop. 368,302. *Pron.* See-atle.

Sea Urchin (*Fr. oursin*). Popular name for several genera of Echinoderms. In it the principal organs are enclosed in a stony casket armed with long spines not unlike those of the hedgehog (*Fr. hérisson*), sometimes called an urchin, whence the name. See Animal colour plate; Echinoidea.

Seaweed (*Algae*). General term embracing several classes of the

great group Thallophyta—plants of simple structure without true leaves, stems, or roots, wood, or vessels. They are reproduced by spores, which are in some cases the result of the fusion of two sexual cells. The entire surface of the plant is capable of absorbing nutriment from the medium in which it lives. What appear to be roots in many species are merely grapples or suckers which attach the plant to rocks or other support, but do not feed it.

In the Rhodophyceae the chlorophyll is in most species masked by a red pigment. In some genera (*Corallina*, *Jania*, and *Lithothamnium*) an external layer of carbonate of lime is secreted, which conceals their vegetable nature and caused them until recently to be classed among corals. Some few species are used as food; others provide fertilisers; and many are valuable as a source of iodine. See *Algae*; *Botany*; *Coralline*; *Dulse*; *Irish Moss*; *Laver*.

Sebastian (255–288). Christian saint and martyr. Born at Narbonne, he went to Rome and entered the army, becoming a captain in the Praetorian Guards in the reign of Diocletian. Not long afterwards he was charged with being a Christian, and the emperor ordered him to be shot to death by archers. He was left for dead, but recovered under the care of a Christian lady named Irene, and

afterwards remonstrated with the emperor, who then had him beaten to death with cudgels. His body was found by another Christian lady named Faustina, and buried in the catacombs, the basilica of S. Sebastian being afterwards built upon the spot. His martyrdom at the archers' hands has been a frequent subject for artists.

Sebastian (1554–78). King of Portugal. The son of Prince John and of Juana, daughter of the emperor Charles V, he was born at Lisbon, Jan. 20, 1554. He succeeded his grandfather, John III, in 1557, and as soon as he came of age began to carry out his dream of a new crusade against the Muslims. Collecting a small army of mixed nationality, he embarked for Tangier, June 25, 1578. On Aug. 4 he met the superior army of the sultan of Morocco, Abd-el-Meleck, and was slain on the field.

Sébastien, François Horace Bastien, Count (1772–1851). French soldier. Born in Corsica, he served under Napoleon at Marengo, 1800; Austerlitz, 1805; in the war in Spain; in the Russian invasion of 1812; and at Leipzig, 1813.



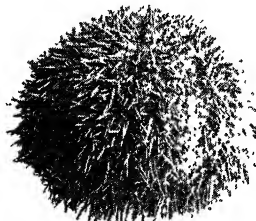
Count Sébastien, French soldier After Winterhalter

Created a count of the Empire in 1807, Sébastien made his peace with the Bourbon regime in 1814, but fought again for Napoleon in 1815. He was eventually restored to his status, and from 1835 to 1840 was French ambassador in London, being made a marshal of France on his retirement. He died in Paris, July 20, 1851.

Sebastiano del Piombo (1485–1547). Italian painter, whose surname was Luciani. Born at Venice, he studied under Giovanni Bellini (*q.v.*) and Giorgione (*q.v.*), and from about 1512 worked in Rome under Michelangelo. Sebastiano, who was known as Piombo, from his office of keeper of the leaden seal to the pope, excelled as a portraitist and religious painter. He died in Rome.

Sebastopol. Variant spelling of the Russian fortress better known as Sevastopol (*q.v.*).

Sebek or SOBEK. Egyptian deity. Originally a crocodile totem, he is represented as crocodile-headed, with sun-disk and uraei. At Kom Ombo he shared the local worship with the hawk-headed Horus. At Arsinoë (Crocodilopolis)



Sea Urchin. Common species found on the coasts of the British Isles

in the Fayum sacred crocodiles were fed and adorned with jewels.

Sebenico, Ital. form of the name of the Dalmatian town described under its Yugoslav form Sibenik.

Secchi, ANGELO (1818-78). Italian astronomer. Born at Reggio, in Lombardy, June 29, 1818, he was educated at the Collegio Romano, where in 1849 he was appointed professor of physics and astronomy. He made a special study of spectrum analysis and of the physical constitution of the sun, moon, and planets, and was one of the earliest astronomers to record solar prominences by daylight. His system of classifying the spectra of stars, which he promulgated in 1863, was accepted by astronomers, and forms the basis of that in current use.

Secession (Lat. *se*, aside; *cedere*, to go). Act of withdrawing. It is used chiefly for ecclesiastical and political movements of this kind. The Presbyterian churches in Scotland have had a number of secessions, and the term Secession Church is specially applied to those who, in 1733, left the established Church, Ebenezer Erskine being their leader. In 1847 they united with the Relief Church to become the United Presbyterian Church, which, from 1900, was part of the United Free Church of Scotland.

Secker, THOMAS (1693-1768). English prelate. Born at Sibthorpe, Nottinghamshire, he was educated



Thomas Secker,
English prelate

at Exeter College, Oxford, and at Leyden. He studied medicine and took a medical degree before, having abandoned the Nonconformist faith of his parents, he joined the Church of England and was ordained. He held livings in Durham and in London, and in 1735 was made bishop of Bristol. In 1737 he became bishop of Oxford; in 1750 dean of St. Paul's; and in 1758 archbishop of Canterbury. Secker died Aug. 3, 1768.

Second. Division of time, one-sixtieth of a minute. It is also an angular measurement, a second of arc, the 360th part of a degree. In fencing, duelling, boxing, etc., seconds are the assistants of a principal, or act for that principal in certain formalities and during the contest. In linear measurement, a second is the twelfth part of an inch. The word is used

in many phrases, *e.g.* second lieutenant, for those acting in a subordinate capacity. *See* Time.

Second. Musical interval comprising but two letters, and therefore occupying adjacent positions on the staff. It has three qualities: minor (1 semitone), major (2 semitones), and augmented (3 semitones).

Second Advent. Theological term for the expected reappearance of Jesus Christ on earth. In theory the Christian life is lived in expectation of this. The early Church believed the event was imminent; modern teaching goes no further than emphasising the belief that the Second Advent will come suddenly. Matt. 24-26; 2 Thess. 2, v. 2; Zech. 14, v. 4 have a special bearing on the question. *See* Adventists; Antichrist; Last Judgement; Messianic Hope; Millennium; Parousia.

Secondary. Term, no longer in common use, applied to a subordinate or auxiliary official, *e.g.* the vicars choral or minor canons of cathedrals. In London the secondary is a corporation officer who carries out in the city the duties performed by the undersheriff in a county, *e.g.* the summoning of juries.

Secondary. In electricity, the secondary winding of a transformer or induction coil is the winding which is not connected to the supply. Transformers (*q.v.*) have usually two windings; the primary which is the winding connected to the source of power, and the secondary which is the winding from which the transformed supply is taken. The secondary winding may have a larger or smaller number of turns than the primary, according to whether the transformer is for "boosting" or reducing the voltage. A transformer may have two or more secondaries, *e.g.* many radio sets have a transformer with a primary wound for mains voltage, and two secondaries, one giving a higher voltage for the valve H.T. supply, and one giving a low voltage for filament heating. There are also windings known as tertiaries, not to be confused with extra secondaries, their purpose being not to give a supply, but to suppress harmonics in the waveform. Auto-transformers have the primary and secondary combined into one electrically continuous winding.

Secondary Enrichment. Term for improvement of a primary ore deposit by a later geological condition. *See* Ore Deposit.

Secondary Rocks. Term formerly used in geology for rocks laid down before the Tertiary period. The term is now obsolete, and is replaced by Mesozoic era.

Secondary School. In England and Wales any institution for the general education of pupils between the ages of 11 plus and 18 plus. The public schools are, in fact, secondary schools, but the term is most commonly applied to those schools under the control of local education authorities, or those receiving direct grants from the state. Before the Education Act of 1944 came into operation fees were paid at the majority of these schools, though there was a generous proportion of "free places." Under the 1944 Act the term has become more clearly defined as comprising the free state-controlled grammar, modern, and technical schools. Until 1951 pupils were prepared for examinations for the general schools and higher schools certificates, with exemption respectively from university matriculation and intermediate B.A. or B.Sc. From 1951 these certificates were replaced by a comprehensive school report and a general certificate of education. *See* Certificate in N.V.; Grammar School; Modern School.

Second Ballot. Electoral device for securing an absolute majority. It is held if the first ballot results in failure to elect the candidate or candidates by an absolute majority. At this stage the candidates are the leaders in the first ballot, the remainder falling out.

Second Chamber. Term used for the upper, usually advisory, house in a legislature of two houses. Method of selection of members varies from country to country: they may be directly elected, indirectly elected, nominated, chosen by birth or status. Examples of second chambers are the house of lords in the U.K. and the senate in the U.S.A.

Seconded. Word the meaning of which varies with the syllable accented. A motion at a public or other meeting is *secon'ded* by its formal supporter; a civil servant, *e.g.*, is *secon'ded* to a dept. other than his own when he is lent, without being transferred, to it.

Second Empire. Name given to the period of French history between Dec. 2, 1852, when Louis Napoleon, having destroyed the Second Republic by a *coup d'état*, was proclaimed emperor, and Sept. 4, 1871, when the Third Republic was proclaimed after his surrender to the Prussians at Sedan.

THE SECOND GREAT WAR, 1939-1945

IRENE CLEPHANE, Associate Editor, The Second Great War

This article gives a general account of the course of military operations of the war in all fields and phases. Detailed accounts of the separate campaigns will be found under their own headings, e.g. Atlantic Battle; Burma Campaign; East Africa Campaign; Europe, Western, Liberation of; Italy, Allied Campaign in; North Africa Campaigns; Pacific War; Russo-German Campaigns. Outstanding episodes are described separately, e.g. Alamein; Ardennes, Fighting in the; Arnhem; Britain, Battle of; D-Day; Pearl Harbour; Rhine; Second Great War; Walcheren; Second Great War; Warsaw; Second Great War. See also Air Raids; Flying Bomb; Mulberry; Radar; Rocket Propulsion; Strategy; Second Great War, and numerous other articles on subjects relating to the war, as well as biographies of leading commanders and statesmen, e.g. Alexander, Viscount; Chernyakhovsky; Churchill; Eisenhower; MacArthur; Montgomery, Viscount; Rokossovsky, Konstantin; Roosevelt, F. D.; Stalin, as well as those of Goering; Hitler; Mussolini, etc.

Fighting in the Second Great War started with Germany's invasion of Poland in the early hours of Sept. 1, 1939, though the war's beginning might well be put back to the Japanese invasion of Manchuria in 1931, and the failure of the League of Nations to stop that act of aggression. The Italian attack on Abyssinia, before which the League proved equally helpless; the German, Italian, and Russian intervention in the Spanish Civil War; Japan's undeclared war on China; Germany's series of invasions of the neutralised Rhine, of Austria, the Sudeten lands, Czechoslovakia itself, and Memel; and Italy's invasion and conquest of Albania were further operations of this opening phase. It is arguable that the war might have been prevented by decisive action against the aggressors at any point in this long succession of aggressive acts; but whereas the aggressors had a single purpose—to increase their territorial possessions, riches, and power—the governments opposed to them were entirely pacific in intent, willing to go to any length to ensure peace, and therefore in no state of preparedness to issue an ultimatum backed by military strength.

German Ultimatum to Poland

By the summer of 1939 Germany under Hitler's leadership was convinced that nothing it could do would lead to serious war, and that if war did come Germany could win easily. That France should actually declare war in support of Poland when she had failed to stand by her ally Czechoslovakia, and that Great Britain should fight for Poland after encouraging France's betrayal of her ally at Munich, was not to be anticipated.

Late on the evening of Aug. 31, 1939, Germany presented to the Polish ambassador an ultimatum of 16 points, to which his govt. was given no time to reply before German aeroplanes and German tanks and soldiers were over the

frontier in the dawn of Sept. 1. Great Britain and France declared war in support of Poland on Sept. 3, and within a week Australia, New Zealand, S. Africa, and Canada had declared war beside the mother country. In three weeks the precarious life of the Polish state was extinguished. Russia, under a secret clause of the Russo-German pact of Aug. 23, 1939, had advanced, on Sept. 17, from her 1921 frontier, to occupy the area E. of the Curzon line which Poland had wrested from her under the treaty of Riga, and Germany was in occupation of the rest of the country.

Russian Expansion in the Baltic

Russia next presented demands to Estonia, Latvia, Lithuania, and Finland for bases. The first three acceded, and then accepted the status of soviet republics of the U.S.S.R. Finland refused, and during the winter, Nov. 30, 1939–March 12, 1940, the Russians fought a brief campaign against her which secured to Russia, in case of German attack, a few more miles of land cover for exposed Leningrad. That it may have had the further purpose of deceiving the rest of the world as to Russia's strength is possible, considering the way in which this war was waged, and the Finns' opening successes. On the other hand, it may be that the Russians underestimated Finnish strength and determination.

Throughout the winter of 1939–40 western Europe was uneasily quiescent. A British expeditionary force of 250,000, with all its transport and equipment, had safely crossed the Channel in mid-Sept., 1939, and taken up its position along the Belgian frontier. There were occasional forays by the French or the Germans in the no man's land between the Siegfried and Maginot lines, but no action of importance. Only at sea was the British navy alert to prevent supplies reaching Germany, and to ensure that supplies did reach the U.K. The Americans, looking on

from their grandstand across the Atlantic, thought the whole thing a farce put on for one of Europe's inscrutable purposes, and named it in inelegant slang the "phoney" war.

But as soon as the weather was once more propitious, the German armies marched again. On April 9, 1940, they invaded Denmark, where they met no military opposition, though later they were to encounter strong passive resistance. From Denmark they crossed the narrow waters to Norway, where in Oslo fifth columnists caused a confusion that enabled the Germans to secure control of the capital within 24 hrs. In the N., from below the hatches of ships that had sailed through coastal waters with the appearance of peaceful merchantmen, well-armed Germans emerged with their guns and seized the chief ports. British and French forces were landed, but not in sufficient strength to be effectual. They were withdrawn; Norwegian armed resistance was rapidly overcome; and King Haakon and the Norwegian govt., who had moved from Oslo to Hamar, fled to England, where they remained the centre of active Norwegian resistance throughout the war. On May 10 British troops occupied Iceland, lest it should be seized by the Germans and thus become a base for U-boats already preying on Atlantic shipping, and for aircraft to cover them.

Invasion of the Low Countries

On the same day, May 10, the Germans marched a third time, to the W., not in direct attack through the Siegfried line on the Maginot line, but against the scrupulously neutral lowlands, Belgium and Luxembourg, their victims in the First Great War, and now also the Netherlands. During the First Great War it had been worth Germany's while to preserve the neutrality of the Netherlands in order to have an assured entrance and exit for goods and information to and from the

beleaguered heart of Europe; convinced in 1940 of the inevitability of her conquest of the whole of Europe, including the British Isles, within a very short space of time, Germany found such forbearance not worth while. Besides, it seems that Hitler genuinely supposed that the Netherlands would welcome absorption into a greater Germany, and was genuinely surprised and affronted at the resistance with which they met his followers and his ideas.

First Campaign in the West

The campaign in the W. lasted seven weeks. The planned defence of the provs. of North and South Holland—heart of the Netherlands—behind the historic water defences was frustrated by the Germans' use of parachute troops, who seized the vital bridges at Moerdijk before they could be broken as planned, and so gave German armour an easy road into the citadel. The ruthless bombing of Rotterdam, May 14, carried out before any reply had been received to an ultimatum to surrender, and the threat that the same fate was in store for The Hague, Amsterdam, and other cities—a fate the small but courageous Netherlands air force was powerless to avert, for its aeroplanes (fewer than 100) were destroyed on the ground—brought the surrender of the Dutch c.-in.-c. four days after invasion; but not before the Queen, much against her will, the royal family, and the cabinet had been brought out of the country to England, there to continue Dutch participation in the war.

The Belgian armies held out, as did some Dutch troops S. of the Schelde; but the uncertainties of French command, and the contradictory orders of Weygand, weakened collaboration between the Dutch, Belgian, British, and French troops available, and led to a break in the line of defence—which at its best would not have been strong, since it was improvised, owing to the determined neutrality of the Dutch and Belgians until they were attacked. Through this break German armour poured, isolating the Belgian army, which surrendered May 28, and also isolating the British and a considerable French army in French Flanders. By the remarkable calmness of the Channel, all but a few thousand of these 375,000 troops were during May 26–June 4, with the help of the British and French navies and of thousands of small and large British merchant and pleasure

ships, lifted from Dunkirk across to England in what Winston Churchill called "a miracle of deliverance." Most of the French elected to be repatriated and were sent back to southern France. A few remained to continue the fight from the U.K. Another British brigade was actually landed in Normandy at this time, when the French had a plan to hold the Brittany peninsula; but this plan came to nothing, and British troops remaining in France after the Dunkirk evacuation were got out through Cherbourg and other ports of the Cotentin peninsula.

Meanwhile the Germans swept on, cutting ruthlessly through the massed refugees fleeing S. before them from Belgium and N. France, whose presence on the roads had impeded all forward action by the less ruthless French and British. The French continued to fall back. The Maginot line, on which they had spent millions, had been effectually turned and was now a disadvantage, for its guns and defences pointed E. instead of W. Nevertheless, while Paris was declared an open city, June 13, abandoned by govt. and troops, and occupied by the Germans June 14, small detachments in the Maginot line fought on determinedly even after Pétain had replaced Reynaud as premier and authorised the signing of the armistice at Compiègne on June 22.

Escape of De Gaulle

Reynaud's attempt to persuade the govt. to move to Algiers, Churchill's inspiring call for a union between France and Great Britain, his visit to the disheartened French govt. at Tours, had failed to stiffen the weak will of a divided govt. which, all too conscious of the terrible losses France had suffered through the First Great War, dreaded prolonged war far more than an ignominious surrender. But one member of Reynaud's govt., who had joined it only on June 6, was flown out of France by the R.A.F. at the last minute. He was General of Brigade de Gaulle, a man almost unknown in his own country, though well known in Germany for the excellence of his book on the use of tanks in warfare, which had been a textbook in German military training. He reached London on the day of the armistice, and was given immediate facilities to broadcast an appeal to the French to continue resistance, to come out of France and join the army, navy, and air

force groups of Free Frenchmen then already in process of formation on British soil.

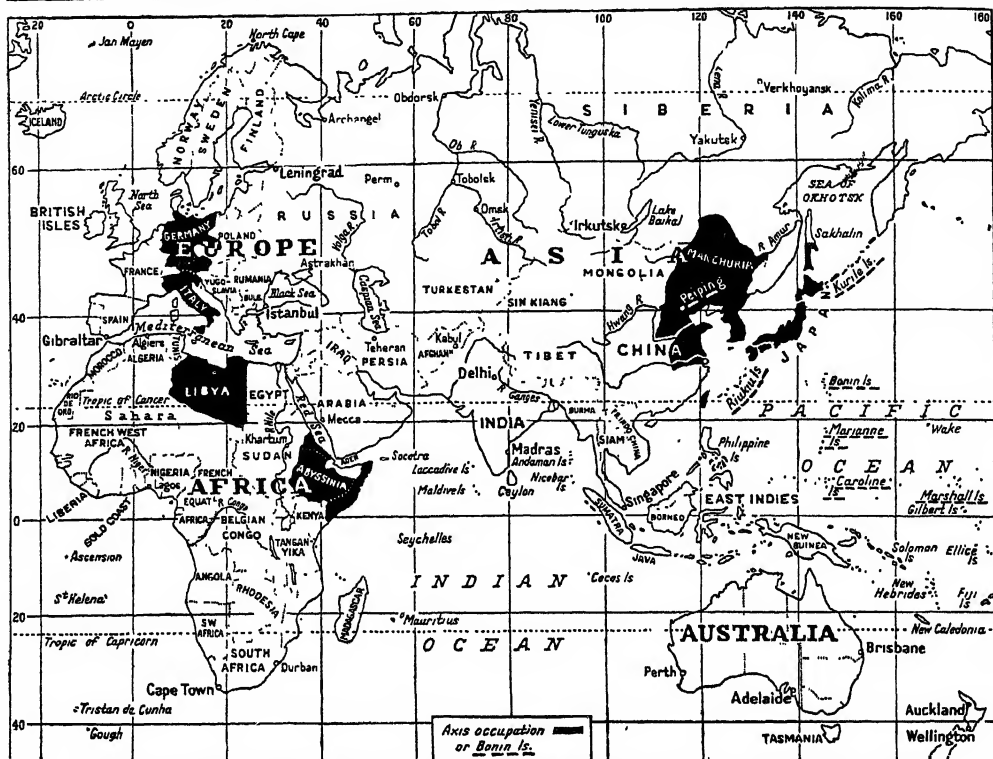
Under the terms of the armistice Germany occupied the N. and W. coasts of France (see map, page 3530). On June 10 Italy had declared war on France and Great Britain, believing both to be defunct. Italian soldiers marched over the border: Mussolini entered Nice in triumph; and Italy was allowed to remain in occupation of French territory to a depth of a few miles along the Italian border. The remainder of France, some third of the total, was left unoccupied, under the rule of Pétain's govt., which moved to Vichy.

The Battle of Britain

For a few weeks there was again quiescence. Grim, but less uneasy; for Great Britain and the British Empire alone stood against Germany and Italy, bottom seemed to have been reached, and there was an atmosphere almost of light-heartedness in Great Britain, now dependent only on herself and the dominions, as she waited for Germany's onslaught. As soon as Germany had established her air force in forward bases, it began. First on ports and shipping, then on aerodromes, and then, when these attacks failed of their object, on London and the industrial centres of the Midlands and the N., the German air attack fell. In the U.S.A. well-wishers and ill-wishers of the U.K. and the British Empire alike waited for the end.

But the air attacks were beaten off by the valiant persistence of the R.A.F.'s few pilots, returning again and again to combat with scarcely a respite. Germany shelved her invasion plan. Heavy air raids continued almost nightly, until the great fire raid on London of the night of Dec. 29–30. Then the Germans drew back to take stock and consider their next move. With Great Britain unconquered and still in command of the seas, Germany had need of all her ingenuity to make good the shortages caused by the now complete sea-blockade of the German-occupied coasts of Europe.

While Germany had been attacking Great Britain, in the full anticipation that her surrender could not be long delayed, Italy struck at the British in Somaliland, Aug. 4 (evacuated by the British Aug. 19) and in Egypt, Sept. 13. In Oct. Italy invaded Greece. But in the Balkans and in Africa Italy found herself in retreat until Germany came to



Second Great War. Extent of territory in the possession of Germany, Italy, and Japan, August, 1939

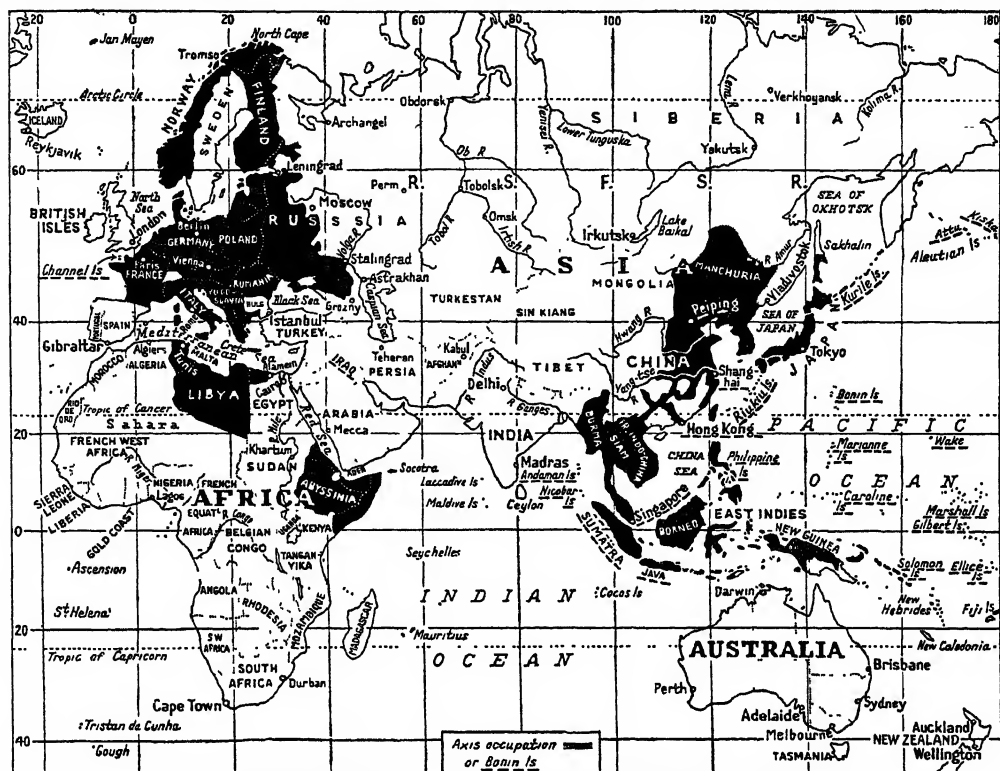
her aid and during March and April, 1941, conquered Yugoslavia and swept the hastily improvised force of British, New Zealanders, and Australians which had been rushed to the aid of Greece out of the Balkan peninsula, and then out of Crete; and, in N. Africa, drove Wavell's inadequate remaining forces there back to the Egyptian border and beyond, leaving only besieged Tobruk of Italian Libya in British hands. The British, meanwhile, having reconquered British and Italian Somaliland, went on to invade Abyssinia, capturing Addis Ababa, the capital, on April 5, 1941, and compelling the surrender of the Italian viceroy, the duke of Aosta, on May 18. Fighting continued in the Gondar area until that fortress surrendered on Nov. 27; but the British conquest of Italian E. Africa was virtually completed with the surrender of the viceroy.

Another pause in Europe followed the German conquest of Yugoslavia and Greece. Then on June 22, 1941, with no declaration of war, Germany crossed the Russo-German border in occupied Poland. Churchill, putting at rest

any doubts there might have been in British and American minds as to his govt.'s attitude in the new situation, declared the same day that all possible aid would be given by the U.K. to Russia. In less than a week the Germans were on pre-war Russian territory, and advancing rapidly. Finland, smarting from her earlier defeat, declared war on Russia on June 27; so did Hungary. The convoys of arms, tanks, ammunition, and aeroplanes, which continued summer and winter to the end of the war in Europe, began their hard passage between Great Britain and the far N. of Russia, battling through the waters off the Norway coast, not only against the weather, often inclement even in summer, but also against submarines, air attack, and mines.

Within three months of the invasion, German forces threatened Leningrad; within four they threatened Moscow; and the Russian govt. moved to Kuibishev in Oct.; but stubborn Russian defence, costly in lives, held the Germans off these two great cities, and the main German pressure was diverted to the S.

The onset of winter gave the Russians an advantage of which they made immediate use. The hitherto unconquered Germans had expected to annihilate the Russian armies long before the snows, and their forces were unprepared to meet the bitter conditions of a Russian winter. The Russians regained some part of the land that had been overrun, action slowed down, and the Germans went into winter quarters in the towns they had captured. But they held a large part of the grainlands of the Ukraine, and were investing Sevastopol. With the spring they decided that the coal and iron of the Don basin, and the oil of the Caucasus, were of more importance than the actual and the former capitals of Russia, and though pressure was maintained against Leningrad, which, except for transport across Lake Ladoga, was for two years cut off from the interior of Russia, they devoted their chief energies to offensives in the S. Sevastopol was overcome, after a seven months' siege, on July 3, 1942; by mid-Sept. there was fighting in the outskirts of Stalingrad, the great iron



Second Great War. Farthest limits of occupation of territories by the Axis powers

and steel centre of the Volga port created out of the former Tsaritsin, and it was invested N., W., and S. by an army under General von Paulus; the Caucasus was invaded, the Germans reaching Nalchik, only 60 m. from Grozny, one of the principal oil centres, on Nov. 2. The Russians had retreated eastwards $2\frac{1}{2}$ times the distance from the Franco-German frontier to the western seaboard of France; and they were prepared if necessary to retreat into Asia, whither they had during the autumn and winter of 1941–42 transferred most of the industrial workers as well as most of the machinery from the Don basin before it was overrun.

By 1942, however, an entirely new factor had come into the war. Japan, fighting to conquer China since 1937, decided in 1941 that the time had come when she was strong enough, and her potential opponents weak enough, for her to take on also the U.S.A. and the British Empire. On Dec. 7, while her envoys were conducting discussions in Washington, Japan made an attack by seaborne aeroplanes on the U.S. naval base of Pearl Harbour in Hawaii, in

which she sank nine vessels, put out of action six others, and rendered the U.S. incapable not only of offence but of defence in the Pacific. On the same day Japan invaded Siam and seized Shanghai; Japanese forces landed in Hong Kong and Malaya; on the 10th in the Philippines. On the 10th also the only two powerful British war vessels in the Far East, the Prince of Wales and the Repulse, were sunk off Malaya by attack from seaborne aircraft, and the British fleet in the Pacific was rendered as helpless as the American. Hong Kong fell to the Japanese on Christmas day, 1941, Singapore on Feb. 15, 1942; the Netherlands East Indies, invaded first by parachute troops at Palembang, Sumatra, on Feb. 14, were in Japanese hands with the surrender of the Dutch in Java on March 9. Bataan in Luzon, largest island of the Philippines, held out until April 8, Corregidor, the small, strongly-fortified island at the entrance to Manila Bay, until May 6.

The British evacuated Burma on May 15, 1942. The Japanese landed at Rabaul in New Britain Jan. 23, 1942, and in New Guinea

at Lae and Salamaua, on March 8, but here they did not make such rapid progress as they had done elsewhere: the Australians, seeing invasion of their continent imminent, stubbornly defended first Australian-mandated New Guinea, then Australian New Guinea (Papua). During the year the Japanese seized Attu and Kiska in the far north, and numerous other islands in the central and southern Pacific, turning some of them, as well as groups of islands administered by them under League of Nations mandate, into powerful naval and military air bases.

The U.S.A., startled out of complacency by the shock of the Japanese attack, and the ease with which Japan proceeded to conquer in a few months so vast an area of the Pacific, set to work with intense energy. Tokyo in its turn was startled by an air raid on April 18, 1942—Col. Doolittle, leading a formation of aircraft from the U.S. carrier Hornet, bombed not only the Japanese capital but Nagoya, Kobe, and Osaka also, and flew on to land in China, now one of the Allies. Lease-lend, introduced

by Roosevelt for the benefit of Great Britain in March, 1941, was extended to Russia with the entry of the U.S.A. into the war in Europe, and a stream of armaments from the U.S.A. flowed overland through Persia (which had been partially occupied by Russian and British troops since Aug., 1941) into Russia, supplementing the supplies sent by the British northern convoy route.

The Americans were ready to strike in the Pacific in Aug., 1942, and on the 7th they landed on Guadalcanal and others of the Japanese-occupied Solomon Islands. The Japanese, still advancing in New Guinea, reached Iorabaiwa, only 32 m. from Port Moresby, on Sept. 15. But fifteen days later they were forced to withdraw to the N. The U.S. landing on Guadalcanal and the retreat of the Japanese from Iorabaiwa marked the turn of the tide in the Pacific.

Benghazi to Alamein

In North Africa, meanwhile, fortunes had varied. The British, driven back inside the Egyptian border in April, 1941, took the offensive again in Nov., shortly before the surrender of the Italians at Gondar, relieved Tobruk Nov. 26, and advanced to take Benghazi on Christmas eve. But now the Germans were in N. Africa in force; they recaptured Benghazi on Jan. 29, 1942, and the British withdrew to Gazala in early Feb. A German offensive in Libya, under Rommel's command, beginning on May 26, drove the British back to Alamein by July 1, and included the capture in a few hours on June 21 of Tobruk, which had held out during the previous year for more than seven months.

The British situation in N. Africa appeared so unsatisfactory that Churchill visited Cairo in Aug., on his way to Moscow, to see for himself what needed to be done. He found the fault to lie with insufficient tanks, guns, ammunition, and men rather than with the commanders or their troops; but he felt that success could not be counted on under the commanders whose names had become associated with retreat. New commanders were appointed; additional troops were sent out to be trained in desert warfare; large numbers of tanks and guns were sent from the U.S.A. on the long voyage round the Cape of Good Hope and through the Red Sea; and on Oct. 23 Gen. Alexander, with Lt.-Gen. Montgomery in

operational command, attacked Rommel at Alamein, and in the 16-day battle of Egypt drove the Germans back into Libya. This was the turning point in the W., and the beginning of the 2,000 m. German-Italian retreat across N. Africa which ended in Tunisia in May, 1943.

In Stalingrad, a strip of the city along the Volga waterfront still remained in Russian hands when on Sept. 23, 1942, a Russian counter-offensive N.W. of the city slightly relieved the German pressure on it. In mid-Oct., however, the Germans made a determined new attack on Stalingrad, with intense air and artillery bombardment. The Russians opened a counter-offensive inside Stalingrad on Nov. 1, using arms and fresh troops brought by night across the Volga, and a powerful new offensive outside the city on Nov. 22. They crossed the Don N.W. of Stalingrad on Dec. 5. This was the turning point in Russia. General von Paulus's 6th army, surrounded and cut off from the W., were annihilated by Feb. 2, 1943, by which time the fighting front was nearly 200 m. to the W.

Another Russian offensive opened in the Caucasus on Dec. 24, 1942, while the siege of Leningrad was raised on Jan. 18, 1943, with the capture of Schlüsselburg from the Germans (though the blockade was not completely broken for another year). There were German counter-offensives in March, 1943, in which the Russians lost reconquered Kharkov and Bielgorod, and on the Orel-Kursk-Bielgorod front in July; but save for these setbacks the Russians advanced consistently during 1943 and 1944.

British Raids on French Coast

War operations in western Europe consisted throughout the second half of 1941 and the whole of 1942 of occasional not very heavy air attacks by the Germans on the U.K., and air attacks of mounting strength on German centres of industry and communications, both in Germany and in German-occupied countries; and British commando raids on Boulogne and Le Touquet on June 4, 1942, and a British reconnaissance in force on Dieppe on Aug. 19, 1942. These landings achieved little except to prove that the Germans had strongly fortified and garrisoned the French ports, and that very careful preparation and very powerful forces would be needed to effect a suc-

cessful landing on the French coast. But plans for an Allied invasion of Europe began to be discussed between Roosevelt and Churchill and the chiefs of staff of their two countries when in June, 1942, Churchill visited Washington for the second time since the U.S.A. entered the war. The Americans favoured an immediate attack in Europe. Russia, unaware of the immense problems and risks attending an invasion from the sea, also appeared to expect an invasion of W. Europe already in 1942. But Churchill, fully alive to all the difficulties, persuaded Roosevelt to agree to an invasion first of French N. Africa, which was under the control of the Vichy govt., in order to assist the intended British attack in Egypt.

Allied Landings in N. Africa

Allied forces, mostly American with some British, under the American Lt.-Gen. Eisenhower in supreme command, were transported, some from the U.K. and some from the U.S.A., in two large convoys which made landfall on Nov. 8, 1942; the day Rommel, defeated in Egypt, started to retreat westwards. Contrary to their expectation, the Americans, who landed first, met some opposition from the French troops in Algeria; but in less than a week Darlan, Vichy minister of defence, who happened to be on a tour of inspection in N. Africa at the time, came to terms with the invaders. (In France, the Germans made Darlan's change of front the excuse for occupying the whole of the country, Nov. 11, 1942.) The delay, however, had been long enough to enable the Germans to rush in to Tunis by air and sea from Sicily and Italy sufficient forces to prevent the Allied troops—relatively few in number, and most of them fresh to battle—from taking possession of Tunisia by simply marching into it.

The Allies were within 15 m. of Tunis by the end of Nov., and there they were held and then driven back. The 8th army, after a spectacular advance from Alamein which included periods of rushing, to keep up with the retreating Axis forces, interspersed with bloody battles, entered Tunisia on Jan. 29, 1943. Only then did the Allied forces from the W. make further progress; and there were still more than three months of hard fighting before, on May 12, the last Axis forces in Africa surrendered in the Cape Bon peninsula.

Two months later, on July 10, 1943, the western Allies invaded Sicily. Churchill was convinced that Italy was "the soft underbelly" of the Axis. So far as the Italians were concerned, he was right. The conquest of Sicily was achieved in 39 days instead of an estimated 90. The rapidity with which Sicily was being overrun so upset the morale of the Italians that Mussolini, fresh from conversations at Feltre with Hitler, who had refused to supply troops to defend Italy for the Italians unless they gave up all the peninsula below Lombardy, was compelled to resign, July 25. The new govt., under Badoglio, promptly opened secret negotiations with the British and Americans, and Italy's unconditional surrender was signed at Cassibile on Sept. 3, the day Allied troops landed in Italy itself, in Calabria. The surrender was kept secret until Sept. 8, the day before the Allies made their third landing in Italy, in the Gulf of Salerno; but by then the Germans, who had suspected Italy's intentions from the moment of Mussolini's overthrow, were in control of the country to a line running somewhat S. of Salerno and Foggia.

Campaign in Italy

The Allied troops landed in Calabria, and others, landed on Sept. 9 at Taranto, advanced against little or no opposition; but the landings at Salerno met fierce German resistance, and from Salerno to Bologna the campaign in Italy proved one of the bitterest and most long-drawn-out of the whole war. Churchill had expected that the Germans would not think Italy worth defending; when he found that they did, and that almost every mile had to be fought for, he came to regard it as simply a diversionary field of operations, and the Allied commanders in Italy found themselves deprived of their seasoned troops, which were taken for service in other fields, and left with new battalions fresh to war to fight grim battles in gruelling country which had been heavily fortified.

For by the time Italy was invaded, plans were well ahead for the invasion of France. At the first Quebec Conference, Aug. 17-25, 1943, Roosevelt and Churchill and their chiefs of staff had considered both the Pacific and the European war, and had decided on further action in both fields. The South-East Asia Command was set up, with Lord Louis Mountbatten as supreme com-

mander, on Aug. 25. This decision was announced. But another decision, not announced, was to invade France. The date set at first was May 1, 1944, and a planning staff was set up in London under Lt.-Gen. Sir F. E. Morgan. In spite of the continuing U-boat campaign in the Atlantic, U.S. troops had begun to arrive in Northern Ireland in Jan., 1942; and ever increasing numbers, eventually totalling several millions, safely reached the U.K. U.S. air forces began operating from their first stations in the U.K. in Aug., 1942. Details of the coming campaign were gradually worked out, and its material needs supplied by invention and hard work—many of them, including the greatest surprise of all for the Germans, the artificial harbour given the code name Mulberry, made in the U.K. Further discussions between Churchill and Roosevelt at Cairo before they went on to meet Stalin at Teheran were followed by the announcement towards the end of 1943 that Eisenhower had been chosen supreme allied commander of the European expeditionary force. He left the Mediterranean, his place being taken on Jan. 8, 1944, by Gen. Maitland Wilson, and came to London, where he arrived Jan. 15, his actual appointment as supreme commander dating from Feb. 14. Montgomery, who had led the 8th army in virtually unbroken triumph from Alamein to the river Sangro, and was to be in operational command of the ground forces taking part in the invasion, had arrived in London during Dec., 1943.

Shortage of Landing Craft

The invasion plan as first made provided for simultaneous invasions of Normandy and of the French Riviera, the first to be the main onslaught, the second a strong diversionary operation. In Italy, when Maitland Wilson took over, the Allied advance had been held by determined German opposition in the Liri and Sacco valleys on the W. and below Pescara on the E. Gen. Alexander, in operational command, had urged on Eisenhower in Oct., 1943, the desirability of a landing behind the German line, if possible in Nov.; but already the Mediterranean was being denuded of landing craft in preparation for the invasion of Normandy; and the landing eventually made at Anzio on Jan. 22, 1944, was not strong enough to do more than just hold its ground against the

German forces in possession of the area.

In Jan., 1944, it was decided to increase the strength of the assault on Normandy from three divs. with a follow-up of two divs. to five divs. with a follow-up of two divs. This led to the postponement of the date of invasion from May 1 to the beginning of June, because it would probably have been impossible to provide sufficient assault craft by the earlier date. When the same problem of shortage of craft made it impossible to stage the northern and southern invasions of France simultaneously, Maitland Wilson on June 19 urged the abandonment of the southern invasion, and the substitution for it of an invasion of Trieste in Sept., with a concentration of all available forces in the Mediterranean area in the armies in Italy, under Alexander's command, so that an Allied advance could be made through the Ljubljana Gap to Vienna.

From Feb., 1944, onwards the Allied air assault on Europe steadily increased in weight. Bridges, marshalling yards, centres of research, of heavy industry, and of synthetic petrol manufacture, and factories making aircraft and other war materials were the objects of heavy raids by day and by night.

D-Day Invasion of Normandy

In spite of high winds and heavy seas, the invasion of Normandy, involving the movement across the Channel of more than 5,000 vessels, was successfully carried out on June 6, 1944. One among many considerations prompting Eisenhower's decision to strike in spite of the inclement weather was the knowledge in high Allied quarters of the existence of the flying bomb (first of which fell on England on June 13, one week after the invasion), and possibly other secret weapons, subjects of continual boasting by Hitler. Had the flying bomb been perfected a few weeks earlier, or the invasion postponed for the month that would have been necessary if Eisenhower had not taken his bold decision, the flying bomb might have proved a far more important factor in the war than it did.

Mulberry harbour was brought into being, and the lodgement area was steadily enlarged. For several days the Germans assumed the Normandy landing to be a diversionary operation, and continued to hold the bulk of their forces in the Pas de Calais, expecting the

main assault to occur at one of the Channel ports. They certainly never anticipated that the "military idiots," as Hitler had called the Allied service chiefs, would invent, bring with them, and successfully construct their own harbour. But as the days went on, and it became apparent that the Allies were pouring men and material into their Normandy bridgehead, the Germans at last sent strong reinforcements. W. The British, on the E. of the sector, encountered the full weight of German armour; the Americans, on the W. of the sector, broke out westward, then N. into the Cotentin peninsula to take Cherbourg on June 27; westward again into Brittany, and then in a north-easterly sweep towards Paris, with comparatively light opposition, though they had to fight hard against a determined German attempt near Mortain to cut off the troops in the Cotentin from those wheeling S.W. towards Brittany, and again, with the British, to liquidate the German 7th army encircled in the Falaise pocket.

Landing in S. France

Maitland Wilson's plan for a landing at the head of the Adriatic was not accepted, and the first decision to land in southern France was maintained. This landing was made on Aug. 15. It had to overcome relatively feeble resistance, for by that time most of the German forces in the S. had been withdrawn, and the mixed forces constituting the U.S. 7th army advanced up the valley of the Rhône to meet the Allied forces from the W. near Somborn on Sept. 11, four days later passing under Eisenhower's command.

Eisenhower, having liberated Paris on Aug. 24 and Brussels on Sept. 3, hoped to turn the Siegfried line and deprive the Germans of the Rhine as a line of defence by an air crossing of that river in the Netherlands. The carrying out of this plan on Sept. 17 involved three air drops, two S. of the Rhine, which were completely successful, and a third N. of it, at Arnheim, which, initially successful, failed for three reasons: (1) the aircraft available were insufficient to give adequate strength to more than two air drops, and as the two S. of the Rhine were essential to the success of the third N. of it, the first two had prior claim; (2) the fortuitous presence near Arnheim of German armour retreating from Fortress Holland in the expectation that the Allied move would

succeed; (3) the fanatical opposition encountered by the Allied ground forces which, advancing successfully to Grave and Nijmegen, could not extend their narrow corridor the required further 15 m. to reach Arnheim in time.

Effects of Arnheim Failure

Grave and Nijmegen were held, and the corridor was gradually widened; but the failure of the full attempt brought untold suffering to the people of the Netherlands, as well as, in all probability, prolonging the war for at least six months. The Germans, already withdrawing from the provinces of N. and S. Holland, where the people began immediately to celebrate, returned in force, determined to hold the base from which, on Sept. 8, they had begun to launch their rocket weapons at England. A rly. strike, started on Sept. 17 by the Dutch workers in response to a broadcast call from Queen Wilhelmina, and maintained to the end of the war, gave the Germans the occasion to refuse, as a reprisal, to bring in any more food or coal for the inhabitants, thousands of whom in the big towns died of starvation during the terrible winter of 1944-45.

The conquest of the Rhine by air having failed, Eisenhower recast his strategy, and determined to bring his forces up to the right bank of the great river at least from its mouth as far S. as Düsseldorf before again attempting to cross it.

Meanwhile, by the end of Sept., 1944, the Russians had cleared the Crimea (May 12); invaded Rumania (April 2), which country surrendered to the Allies (Aug. 23) and declared war on Germany (Aug. 25); invaded Estonia (July 19); forced Finland out of the war (Sept. 19); invaded Bulgaria, which, though a German satellite, was not at war with Russia, and compelled the govt. to declare war on Germany (Sept. 8). In Oct. Russian forces crossed the Hungarian frontier (6th); captured Riga, capital of Latvia (13th); took Petsamo in Finland from the Germans on the 15th, and Belgrade, capital of Yugoslavia, on the 20th; entered East Prussia on the 23rd and Norway on the 25th. Budapest the Red army encircled by Dec. 26. Owing however, to lack of suitable craft for crossing a major river very strongly held on the opposing bank the Russians had failed in Aug. to cross the Vistula from Praga, some 450 yds. broad at that point, and relieve the Polish underground army fighting in Warsaw under

Gen. Bor-Komorowski. In this second battle of Warsaw, which lasted from Aug. 1 to Oct. 3, most of the city was reduced to rubble, and the Polish underground army was virtually annihilated.

The shortage of landing and assault craft which had made impossible a landing in force in Italy to take Rome more quickly, and necessitated the postponement for more than two months of the landing in S. France, as well as the Allied decision to settle the European contest first, affected the conduct of the war in the Far East, where throughout 1943 the Allied advance, if sure, was slow. American reconquest of Guadalcanal took from Aug. 7, 1942, to Feb. 10, 1943. By then the Australians had pushed the Japanese out of Papua (Jan. 23, 1943). The Japanese were cleared from the Aleutians by Aug. 15; from New Georgia by Aug. 28. Americans landed at Nassau Bay in Australian-mandated New Guinea on June 30, Australians and Americans near Lae on Sept. 4 and 5.

Burma: Turn of the Tide

Mountbatten, on taking up his appointment to the new command in South East Asia in Aug., 1943, wanted to attack the Japanese in Burma by a combined operation on the coast; but no landing craft could be spared to him; and it was not until the spring of 1944 that he was able to begin to attack overland. The small area of India near Imphal invaded by the Japanese on March 17, 1944, was cleared by Aug. 25. Stilwell, who had started in Dec., 1942, on his great trek from Leda through the jungles of Japanese-held northern Burma to build a new road connecting with the old Burma road somewhere near the Burma-China frontier captured Myitkyna airfields on May 17, 1944, the town of Myitkyna itself on Aug. 4, and completed the conquest of a route, and the road itself, on Jan. 23, 1945.

The Australians, with American aid, had secured control of the whole of the island of New Guinea by May, 1944, though pockets of Japanese troops still remained in the mts. of the N. and in the S.W. area of the island; the Americans had gained control over the Gilbert (Nov., 1943) and the Marshall Islands (Feb., 1944) in the central Pacific, and of the Marianas in the W. Pacific (Aug., 1944), and between Oct. 20 and Dec. 25 reconquered Leyte, central island of the Philippines.

The failure of the plot against Hitler's life, which came to a shor-

tive fruition in July, 1944 (*see* July Plot), had cleared from Germany all those who might have attempted to come to terms with the Allies before their country was devastated; and in Dec., though against his own judgement, von Rundstedt staged the offensive in the Ardennes that not only failed, but left Germany with no reserves for fighting the final battle that followed it on German soil. During March, 1945, the Allies made a powerful crossing of the Rhine in force near Wesel on the 24th, and two unexpected but useful lesser crossings farther S. The stand made under F.-M. Model by the 650,000 Germans encircled in the Ruhr was overcome between April 1 and 18. All organized resistance to Montgomery, commanding in N.W. Germany, ceased on March 27.

From Rome to Rimini

In Italy, the Allied forces, held at Cassino from Feb. to May 18, 1944, by desperate German defence covering the only practicable road to Rome, raced forward to meet on May 25 the troops which had at last broken out from the Anzio beach-head, and on to take Rome, June 4, evacuated by the Germans although they threatened to hold it. Alexander was hopeful that in spite of the denuding of his forces to make the landing in S. France he could still drive the Germans out of Italy by the end of 1944; and as the Allied 5th and 8th armies—the first under American, the second under British command, but both very mixed, and composed of British, American (including Negro), French, S. African, New Zealand, Brazilian, Greek, Polish, and, in the later stages, Italian troops—fought on doggedly up the backbone of Italy, it seemed that his hope might be realized. But Rimini was not taken as had been planned at the beginning of Sept., and when it fell on Sept. 21, torrential autumn rains had begun to fall, and it was impossible to advance into the low-lying valley of the Po, criss-crossed as it is by watercourses. The Allies did succeed in crossing the Rubicon (going N.), but there they were stopped until the following April, when Italy, with the help of Italian partisans, was cleared of the Germans at a breakneck pace, all German forces in Italy and a large part of Austria surrendering to Alexander (supreme Allied commander, Mediterranean, from Nov., 1944) at Caserta on April 29, 1945.

The Russians liberated Warsaw on Jan. 17, 1945, and cleared Buda-

pest on Feb. 13, after six weeks' fighting in and around the city. They invaded Pomerania, Brandenburg, and W. Prussia on Jan. 29. Königsberg (Kaliningrad), the last centre of resistance in E. Prussia, fell to them on April 9.

The Allied forces in Germany were now rapidly approaching one another from E. and from W., and after encirclement of Model's two army groups in the Ruhr on April 1, to effect a junction with the Russians became a primary consideration for Eisenhower. He informed Stalin of his general plan to strike in the centre and then to link with the Russians somewhere in the Regensburg-Linz area, with the object of cutting off the mountainous S. from the N. of Germany, and so preventing the retreat to the "redoubt" in the Bavarian-Austrian highlands about which Hitler had talked. In his report to the combined chiefs of staff, Eisenhower states:

The decision to concentrate first upon a major thrust in the centre nevertheless gave rise to some misgivings. The desirability of bringing the U-boat war to an end, of opening up supply lines through the N. German ports, of acquiring the use of Swedish shipping, of relieving the Dutch, and of occupying Denmark and Norway, and the political and psychological effects of an early entry into Berlin were all advanced as reasons in favour of early operations in the 21st army group sector [*i.e.* Montgomery's sector in the N.].

We had not forgotten the important advantages to be gained by the conquest of N. Germany. It was merely a question of timing that was at issue. Our plan for an advance in the centre was itself intended to facilitate such a conquest which, I was convinced, could more easily be achieved once Germany was cut in two. It was vital that we should concentrate for each effort in turn rather than allow our power to be dispersed by attempting to undertake too many projects at once . . . Berlin, I was now certain, no longer represented a military objective of major importance.

Russian Capture of Berlin

The capture of Berlin was therefore left to the Russians, who entered the capital on April 23. Two days later Allied troops from East and from West met at Torgau on the Elbe. Berlin was conquered, a wrecked city, on May 2, and in the cellars of the chancellory, where Hitler and a few followers had remained to the last, Goebbels, his wife, and his family were found dead of poison. Evidence pointed to the earlier suicide of Hitler. All the German forces in Holland, Denmark, Slesvig-Hol-

stein, and the N.W. of Germany surrendered unconditionally to Montgomery on May 4, 1945, the surrender taking effect next day; a general surrender to all the Allies was signed at Eisenhower's h.q. at Reims at 2.41 a.m. on May 7, and ratified in Berlin on May 9.

Pacific: Final Phase

The progress of the war in the West made it possible, towards the end of 1944, for the British to send a substantial fleet to the Pacific. American operations in the Philippines extended to Mindoro (conquered Dec. 15–29, 1944) and to Luzon, where U.S. forces landed on Jan. 9, 1945. Manila was recaptured Feb. 4–6 (though desperate suicide groups of Japanese continued to resist in the old walled town of Intramuros until the 24th); Bataan and Corregidor were recaptured on Feb. 16. In the mts. and some of the smaller Philippine islands, Japanese remained until the general surrender; but the Philippines were again under American control.

British forces advancing overland in Burma captured Mandalay on March 20, 1945, while a combined operation from seaward secured Rangoon on May 3 and ended all effective Japanese resistance in that country. The Australians landed on Tarakan off Netherlands Borneo on May 1, in Sarawak on June 20, and at Balikpapan on July 1. Preparations were going forward for an invasion of Malaya from India. At great cost in lives, the Americans invaded and captured Iwojima, in the Japanese Bonin islands, Feb. 19–March 16, and Okinawa in the Ryukius, part of the Japanese homeland, April 1–June 21. On July 14 an intensive Allied naval and air bombardment of the coasts of Honshu, principal island of Japan, began—the big cities, *e.g.* Tokyo, Yokohama, Nagoya, Osaka, Kobe, had since June, 1944, been frequently and heavily bombed by U.S. aircraft based on Saipan in the Marianes, or on airfields in China.

On July 17, 1945, the U.K., the U.S.A., and Russia met at Potsdam, near Berlin, for a conference on the future of Germany, and thither the Russians (not then at war with Japan) brought a tentative peace offer from Japan. This was rejected by the U.K. and the U.S.A., and on July 26 an ultimatum was issued, with China's agreement, calling upon the Japanese govt. to surrender unconditionally. Next day warnings were dropped on eleven Japanese towns

CHRONOLOGY OF PRINCIPAL EVENTS IN THE SECOND GREAT WAR —

1939	1941				
Sept. 1 Germans invaded Poland.	Jan. 22 Australians captured Tobruk, Libya.	Dec. 7 Japan attacked Pearl Harbour; declared war on U.K. and U.S.A.; seized Shanghai; U.K. declared war on Finland, Hungary, and Rumania.	May 4-9 Battle of Coral Sea (naval)		
Sept. 3 U.K., France, Australia, N. Zealand declared war on Germany; Sept. 6 S. Africa; Sept. 10 Canada.	Feb.-March British occupied Ital. Somaliland, reoccupied Brit Somaliland.	Dec. 8 U.K., U.S.A., Canada, Netherlands, declared war on Japan; Japanese invaded Siam and Malaya, attacked Hong Kong.	May 15 British evacuated Burma.		
Sept. 17 Russian troops crossed Poland's E. frontier.	March 11 U.S. Congress passed Lease-Lend Act.	Dec. 10 Japanese landed in Philippines.	May 23 Russians evacuated Kerch peninsula.		
Sept. 27 Warsaw surrendered to Germans.	March 28 Battle of Cape Matapan, Mediterranean.	Dec. 11 Germany and Italy declared war on U.S.A.	May 26 Anglo-Russian treaty signed		
Sept. 28 Russo-German partition of Poland.	April British occupied Eritrea.	Dec. 13 U.K. declared war on Bulgaria.	June 17 British withdrew to Egyptian border.		
Nov. 30 Russia invaded Finland.	April 5 British captured Addis Ababa, cap. of Abyssinia.	Dec. 17 Japanese landed in N. Borneo.	June 21 Germans captured Tobruk.		
Dec. 13 Battle of River Plate, S. Atlantic.	April 11 Germans reached Soltum, Egypt.	Dec. 23 Japanese occupied Wake Island.	July 3 Russians evacuated Sevastopol; Germans in possession of Crimea.		
	April 11-Nov. 26 Axis forces' siege of Tobruk	Dec. 24 British captured Benghazi, Libya.	July 27 Russians evacuated Rostov.		
1940	April 13 Germans captured Belgrade, Yugoslavia; Russo-Japanese 5 year non-aggression pact signed.	Dec. 25 Japanese conquered Hong Kong.	Aug. 4 Germans invaded Caucasus.		
March 12 Finland surrendered to Russia.	April 17 Yugoslavia capitulated to Germans		Aug. 7 U.S. forces landed on Guadalcanal, Solomon.		
April 9 Germany invaded Denmark and Norway.	April 27 Germans occupied Athens.		Aug. 16 Russians evacuated Malokop, Caucasus.		
May 10 Germany invaded Netherlands, Belgium, Luxembourg; British troops landed in Iceland.	May 27 German battleship Bismarck sunk.		Aug. 19 British reconnaissance in force on Dieppe.		
May 11 Churchill formed all-party govt.	June 1 Germans conquered Crete.		Sept. 15 Japanese reached Iorabaiwa, Papua.		
May 14 Germany invaded France; Netherlands army surrendered.	June 22 Germans invaded Russia.		Sept. 16 Fighting on outskirts of Stalingrad.		
May 26-June 4 Evacuation of British and French troops from Dunkirk.	June 27 Finland and Hungary declared war on Russia.	1942	Sept. 30 Japanese withdrew from Iorabaiwa.		
May 28 Belgian army surrendered.	July 1 Germans captured Riga.	Jan. 1 Declaration of Washington (embodying Atlantic Charter) signed by 20 Allied nations.	Oct. 23 Battle of Alamein, Egypt.		
June 10 Italy declared war on France and U.K.	July 7 U.S. troops landed in Iceland.	Jan. 23 Japanese landed in Solomon Is.	Nov. 2 Russians evacuated Nalchik, Caucasus.		
June 22 France signed armistice with Germany; June 24 with Italy.	Aug. 13 Russians admitted evacuation of Smolensk.	Jan. 26 First U.S. troops arrived in N. Ireland.	Nov. 8 Allied landings in French N. Africa		
July 1 Germans occupied Channel Islands.	Aug. 14 Churchill and Roosevelt drew up Atlantic Charter	Jan. 29 Germans recaptured Benghazi.			
July 26 Japanese occupied French Indo-China.	Sept. 21 Germans captured Kiev.	Feb. 14 Japanese parachutists landed in Sumatra.	1943		
Aug. 4 Italians invaded Kenya, the Sudan, British Somaliland.	Oct. 12 Germans captured Briansk.	Feb. 15 Japanese conquered Singapore.	Jan. 14-24 Casablanca Conference (Churchill and Roosevelt).		
Aug. 8-Sept. 15 Battle of Britain, decisive period.	Oct. 14 Germans captured Rzhev.	Feb. 27-March 1 Battle of Java Sea (naval).	Jan. 18 Siege of Leningrad raised.		
Aug. 19 British evacuated British Somaliland.	Oct. 16 Germans captured Odessa.	Feb. 28 Japanese landed in Java.	Jan. 23 British captured Tripoli; Australians cleared Japanese from Papua.		
Sept 13 Italians invaded Egypt.	Oct. 20 Russian govt. moved to Kulbishev.	March 7 British evacuated Rangoon, Burma.	Jan. 27 Siege of Stalingrad raised.		
Oct. 28 Italians invaded Greece.	Oct. 24 Germans captured Kharkov.	March 8 Japanese landed in New Guinea.	Jan. 30 Russians recaptured Malokop, Caucasus		
Nov. 21 Italian retreat in Greece.	Nov. 18 British Imperial offensive opened in Libya.	March 9 Dutch surrendered in Java	Feb. 2 Last Germans at Stalingrad surrendered.		
Dec 15 British invaded Libya from Egypt.	Nov. 26 Imperial forces relieved To rui, Libya.	April 8 Bataan, Philippines, conquered by Japanese.	Feb. 10 Americans cleared Guadalcanal		
	Nov. 27 G nd , Abyssinia, surrendered to British.	April 18 Tokyo bombed by U.S. carrier-borne aircraft	March 3 Russians recaptured Rzhev.		
		May 1 British evacuated Mandalay, Burma.	May 12 Axis forces in Tunisia capitulated.		
			July 10-Aug. 17 Allied conquest of Sicily		

that they were to be destroyed from the air. Five of them were heavily attacked on Aug. 1. Further warnings were followed by further dire air assaults. And then on Aug. 6, 1945, a solitary U.S. aircraft dropped an atomic bomb over Hiroshima. Its effects horrified the whole world. Russia declared war on Japan and invaded Manchuria on Aug. 8. A second atomic bomb was dropped over Nagasaki on Aug. 9, and on Aug. 14, 1945, Japan surrendered unconditionally. Military operations in the Second Great War were at an end.

The Second Great War had cost the U.K. fewer lives than the First — 244,723 service plus 60,585 civilian deaths compared with 812,317; but it had left her immeasurably more impoverished. The greater part of her overseas

investments, interest on which had provided a large part of the invisible factors that had helped to balance her pre-war trading accounts, had been expended on paying for food and armaments during the 18 months before the U.S.A. introduced lease-lend: nearly a third of the buildings in England and Wales had been damaged, more or less seriously, by German air attack; and, after the introduction of lease-lend, the U.K. had turned her industry almost wholly to the production of war materials, making no attempt to maintain her normal trade.

France had suffered few battle casualties, but two millions of her young men had been prisoners of war for more than four years, with inevitable effect upon an already dwindling population, and thousands of citizens, men and women,

had died at the hands of the occupying power because of their part in resistance or as a result of forced labour; French industry had been disrupted and French machinery and stocks pillaged by the Germans, French roads, rivers, bridges, and seaports had been systematically destroyed by Allied air attack, resisters' sabotage, and German demolition.

Up to 1948 no accurate return of Russian deaths was published, but estimates placed total deaths of service men and civilians in the occupied areas as high as eight millions; the destruction of buildings, machinery, rivers, trees, and the land itself, particularly in the Ukraine, was beyond computation; Russia's oldest and most beautiful cities were pounded to dust.

For its size, the Netherlands suffered more severely than any

—FROM THE INVASION OF POLAND TO THE JAPANESE SURRENDER

July 25 Mussolini resigned.
 Aug. 25 S.E. Asia Command set up.
 Sept. 3 Unconditional surrender of Italy; Allies landed in Calabria, Italy.
 Sept. 9 Allies landed in Gulf of Salerno, Italy.
 Sept. 17 Russians recaptured Briansk.
 Sept. 25 Russians recaptured Smolensk.
 Oct. 1 Allies occupied Naples.
 Oct. 9 Russians cleared Germans from Caucasus.
 Oct. 12 Portugal granted Azores bases to U.K.
 Oct. 13 New Georgia islands in Allied hands; Italy declared war on Germany.
 Oct. 25 Russians recaptured Dnepropetrovsk.
 Nov. 25 U.S. forces in control of Gilbert Is.
 Nov. 28-Dec. 1 Teheran Conference (Churchill, Roosevelt, Stalin).

1944

Jan. 22 Allies landed at Anzio, Italy.
 Jan. 27 German blockade of Leningrad cleared.
 March 17 Japanese invaded Assam.
 March 26 Russians reached R. Prut.
 April 10 Russians liberated Odessa.
 May 9 Russians liberated Sevastopol.
 May 12 Russians cleared Germans from Crimea.
 May 17 Allies captured Myitkyina airfields, Burma.
 May 18 Cassino, Italy, captured by Allies.
 June 4 Allies occupied Rome.
 June 6 D-day: Allied landing in Normandy.
 June 10 Russian offensive in Karelian Isthmus.
 June 13 First flying bombs fell in England.
 June 27 Americans captured Cierbourg, France.
 June 30 U.S.A. severed relations with Finland.
 July 9 British captured Caen, Normandy.

July 20 Unsuccessful German attempt on Hitler's life.
 Aug. 4 Allies captured Myitkyina, Burma.
 Aug. 7 Americans secured control of Marianne Is.
 Aug. 12 Allies occupied Florence.
 Aug. 23 Rumania surrendered to Allies.
 Aug. 25 Paris liberated; Japanese cleared from Assam; Rumania declared war on Germany.
 Sept. 3 Brussels liberated.
 Sept. 4 Antwerp liberated.
 Sept. 5 Russia declared war on Bulgaria.
 Sept. 8 First rocket bomb fell in England; Bulgaria declared war on Germany.
 Sept. 11 Americans invaded Germany.
 Sept. 12 Armistice between Allies and Rumania.
 Sept. 17-25 Battle of Arnhem.
 Sept. 19 Armistice between Allies and Finland.
 Sept. 21 Allies captured Rimini, Italy.
 Oct. 20 Aachen (Aix-la-Chapelle) surrendered to Americans.
 Oct. 20-Dec. 25 Americans reconquered Leyte, Philippine Is.
 Oct. 23 Russians invaded E. Prussia.
 Oct. 25 Russians entered Norway, freed Kirkenes.
 Oct. 28 Armistice between Allies and Bulgaria.
 Nov. 1 British Home Guard stood down.
 Nov. 24 Tokyo raided by U.S. bombers based on Marianne Is.
 Dec. 16-Jan. 16, 1945 German counter-offensive in Ardennes.
 Dec. 26-Feb. 13, 1945 Russian siege and capture of Budapest, Hungary.

1945

Jan. 3 British recaptured Akyab, Burma.
 Jan. 9-Feb. 16 Americans reconquered Luzon, Philippine Is.

Jan. 17 Russians captured Warsaw.
 Jan. 23 Ledo Road, Burma, completed.
 Jan. 29 Russians invaded Pomerania, Brandenburg, and W. Prussia.
 Feb. 4-12 Yalta Conference, Crimea (Churchill, Roosevelt, Stalin).
 Feb. 19-March 16 Americans conquered Iwojima, Bonin Is.
 Feb. 22 Allies cleared Germans from Luxembourg.
 March 6 Americans captured Cologne.
 March 8 Americans captured Rhine bridge at Remagen.
 March 20 British recaptured Mandalay, Burma.
 March 24 Allies crossed Rhine in force.
 March 27 Organized resistance in N.W. Germany ceased.
 March 30 Russians captured Danzig; Americans captured Heidelberg and Frankfurt-on-Main.
 April 1-18 Americans conquered Ruhr basin.
 April 1-June 21 Americans conquered Okinawa, Rikyu Is.
 April 4 French captured Karlsruhe.
 April 9 Russians captured Königsberg (Kalliningrad).
 April 12 Death of President Roosevelt; Americans captured Weimar and overran Buchenwald camp.
 April 13 Russians captured Vienna.
 April 14 Arnhem, Netherlands, liberated by British.
 April 23-May 2 Russians captured Berlin.
 April 25-June 25 United Nations Conference, San Francisco.
 April 25 Allies from W. and E. met at Torgau on the Elbe.
 April 26 Bremen surrendered to British.
 April 27 Allies entered Genoa, Italy.
 April 28 Mussolini shot by Italian partisans.

April 29 Germans in Italy surrendered unconditionally.
 May 2 British reached Baltic at Wismar.
 May 3 British recaptured Rangoon, Burma; Allies entered Trieste; British occupied Hamburg.
 May 4 German forces in N.W. Germany surrendered unconditionally to British.
 May 4 Americans captured Berchtesgaden, Salzburg, and Innsbruck, and drove over Brenner Pass to Italy.
 May 6 Allied 5th army crossed from Italy into Austria.
 May 7 Germany surrendered unconditionally.
 May 8 "VE" day; Russians took Dresden.
 May 9 Germany's surrender ratified in Berlin; Channel Is. freed.
 May 10 Americans and Russians entered Prague, Czechoslovakia.
 May 23 Churchill's all-party govt. resigned.
 June 20 Australians landed in Sarawak, Borneo.
 July 5 General election in U.K.
 July 14 Naval and air bombardment of Honshu, Japan, began.
 July 17-Aug. 1 Potsdam Conference (U.K., U.S.A., U.S.S.R.).
 July 26 Allied ultimatum to Japan; Labour govt. in U.K.
 Aug. 6 Americans dropped atomic bomb over Hiroshima, Japan.
 Aug. 8 Russia declared war on Japan and invaded Manchuria.
 Aug. 9 Americans dropped atomic bomb over Nagasaki, Japan.
 Aug. 14 Japan surrendered unconditionally.
 Aug. 15 "VJ" day.
 Sept. 2 Japanese surrender signed in Tokyo Bay.
 Sept. 9 Surrender of Japanese in China signed at Nanking.

other country; not only was the empire in the Far East overrun, pillaged, and left in chaos, but in the homeland inundations—some due to military necessity, as in Walcheren, others deliberate and pointless destruction by the German occupier—drowned one-fifth of the agricultural land. Nearly a third of the people lost their homes; the ports of Amsterdam, Rotterdam, and Flushing were wrecked. Deaths of citizens from forced labour and other causes, including starvation, numbered more than 200,000. The worst-hit community was the industrious Jewish population of Amsterdam: 150,000 before the war, it numbered only 20,000 after it.

Loss of life in Italy was comparatively light, but, in a land of many rivers, scarcely a bridge remained standing, and the Germans

used special machinery to uproot the rly. lines as they retreated slowly up the peninsula, inflicting desperate poverty on a naturally poor country. As for Germany, many of her towns, large and small, were severely damaged; some, notably Berlin, Bremen, Hamburg, Cologne, Essen, and Dresden, were reduced to rubble by bombardment from the air, aggravated in some places by a fierce defence against advancing ground forces. Germany's known dead numbered 1,709,739, missing and prisoners another 1,782,929.

In the Far East, to the devastation of battle and deliberate destruction of installations, plantations, and buildings by both Allies and Japanese, were added the unrest and uncertainty created in untutored minds by Japan's incredibly rapid advance, followed

almost immediately by her decisive defeat and her scarcely less rapid retreat.

The U.S.A. suffered no devastation, and emerged from the war with greatly developed industrial potentialities; but 396,637 U.S. citizens died under arms, compared with 59,578 in the First Great War.

Peace-making was slow. Treaties were signed in 1947 with five of the lesser Axis states—Finland, Rumania, Hungary, Bulgaria, and Italy; but three years after the cessation of hostilities the conclusion of peace with Germany, with her unwilling partner Austria, and with Japan seemed no nearer than when those countries surrendered unconditionally, owing to the apparent impossibility of the Allies' arriving at a compromise mutually acceptable to

Russia on the one hand, the U.K., the U.S.A., and France on the other.

Bibliography. An important source of information on the Second Great War is the dispatches from British commanders published as supplements to the London Gazette; outstanding among these are Wavell's accounts of operations in the Middle East, Feb. 7 to July 15, 1941 (pub. 1946), covering the 1941 campaign in Greece, and of operations in E. Africa, Nov., 1940-July, 1941 (pub. 1946), covering the conquest of Italian E. Africa to the fall of Amba Alagi; Dowding's account of the battle of Britain (pub. 1946); Alexander's dispatch on the African Campaign from El Alamein to Tunis (pub. 1948), with Anderson's on N.W. Africa from Nov. 8, 1942, to May 13, 1943 (pub. 1946); and Montgomery's dispatch on operations in N.W. Europe (pub. 1946). The Report of the Supreme Commander to the Combined Chiefs of Staff on the operations in Europe of the Allied Expeditionary Force (pub. H.M.S.O. 1946) gives a complete account of all the operations, U.S., British, and Canadian, carried out under Eisenhower's command in N.W. Europe; the Report of the Supreme Allied Commander, Mediterranean, on operations in Southern France, Aug., 1944 (pub. H.M.S.O., 1946) supplements this with an account of the landings on the Riviera and the subsequent campaign of the 7th army until it became part of the A.E.F. The war in the Pacific is described from July 1, 1943, to June 30, 1945, in the Biennial Report of the Chief of Staff of the U.S. Army to the Secretary of War (pub. H.M.S.O. 1945).

No official account of the war in Russia was published; but those campaigns, as well as all other aspects of the Second Great War, are covered in *The Second Great War* (nine vols.) compiled from contemporary sources under the general editorship of Sir John Hammerton.

Cyril Falls published a short history of *The Second World War*, 1948. *Crusade in Europe* by Gen. D. D. Eisenhower, was published 1948. Montgomery gave his personal account of his campaigns in Normandy to the Baltic, 1946, and El Alamein to the River Sangro, 1948. Harry Hopkins in his memoirs, published posthumously in 1948, throws much light on the political history of the period; and Winston Churchill, who through his position as inspired and inspiring leader of the British people played a unique part in the conflict, issued in 1948 the first of the several vols. of his *War Memoirs*.

Second Lieutenant. Lowest rank of commissioned officer in the British army. He corresponds to a pilot-officer in the R.A.F., and to a sub-lieutenant in the navy. See Lieutenant; Officer.

Second Mrs. Tanqueray. THE Tragedy by Arthur Pinero. It was produced, May 27, 1893, at the St. James's Theatre, London, where it had a run of 225 performances. The heroine, Paula Ray, is a woman with a past, who, finding that the man engaged to her step-daughter, Ellean, is one of her old lovers, commits suicide. Mrs. Patrick Campbell made her name as Paula, Maude Millett played Ellean, H. V. Esmond appeared as Cayley Drummie, a friend of the family, and G. Alexander as Aubrey Tanqueray. The play has since been several times revived.

Second Republic. Name given to the period of French history between Feb. 24, 1848, when King Louis Philippe abdicated and a republic was proclaimed, and Dec. 2, 1852, when Louis Napoleon was proclaimed emperor as Napoleon III, thus creating the Second Empire. See France: History; Louis Philippe; Napoleon III.

Second Sight. Popular name for several kinds of spontaneous psychical phenomena, including clairvoyance, and premonitory and symbolic visions or hallucinations. It is especially applied to a gift alleged to be possessed by many persons in the Scottish Highlands. Natives of Skye and seventh sons of seventh sons are popularly credited with the power. The seers are generally healthy persons of good reputation for honesty and sobriety, and have included many educated men. The best known kind of second sight is the death-warning, which takes various forms, including "corpse candles" or spectral lights, or an apparition of the doomed person, known as the wraith or fetch. Also, when the object of the warning is pre-

sent, a symbolic shroud is seen wrapping the lower part of his figure, the height to which it extends being believed to indicate the nearness of death. A fatal accident may be seen on the spot before it happens, or at a distance at the time of its occurrence.

Another form of second sight, not specially sinister, is the phantasmal appearance of a person shortly before he actually arrives—perhaps a telepathic phenomenon. The evidence is abundant, but not easily substantiated, especially as in many parts of Scotland the power is supposed to be lost by relating the vision before the event. Closely allied beliefs prevail in other Celtic countries and in Scandinavia. Perhaps persons unusually sensitive to psychic influences are numerous in these regions, but apart from the local symbolism most of the phenomena can be paralleled in all parts of the world. Tales of second sight are well known in connexion with the tragic deaths of the Scottish kings Alexander III, James I, James IV, and Charles I, and Sir W. Scott and D. G. Rossetti have made effective literary use of these traditions. There is an example in Homer's *Odyssey*, Bk. 20. See Apparition; Clairvoyance; Psychical Research; Telepathy.

Second Wind. Term popularly applied to the process by which a runner regains stamina. It is described under Respiration.

Secretary at War. Title of former British government official. The office with this title has been traced to the time of Charles I. After 1670 its importance grew, and from being a secretary to the commander-in-chief, the secretary at war, originally independent of parliament, took charge of military affairs in the house of commons, 1704, and became responsible for army finance, 1783. In 1855 the office was merged with that of the secretary of state for war, and in 1863 it was abolished. See War Office.

Secretary Bird (*Sagittarius serpentarius*). African bird of prey, allied to the vultures, but differing greatly from them in appearance. The name is derived from the pendent crest of long feathers upon the head, which suggest quill pens thrust behind the ears. The bird has long legs, and stands over four feet high; and the tail is nearly two feet long. The plumage is grey and white, with black rump and black and white bars on the tail feathers. It is found throughout S. and E. Africa and in a few of the W.



Secretary Bird. Long-legged species of vulture inhabiting S. and E. Africa

districts. The birds feed mainly on small snakes, lizards, and insects. The nest is constructed of sticks and clay in a tall bush, and appears to be used for several years in succession. The eggs, as large as those of a goose, are laid in August; and the young do not leave the nest for five months. Secretary birds can fly strongly, but they spend most of their time on the ground.

Secretary of State. In the U.K., high officer of the crown, in charge of one of the chief depts. of govt. There are eight secretaries of state—home, foreign, colonial, Commonwealth relations, war, air, and Scotland. The home secretary ranks as the senior secretary.

The early English kings had clerks or secretaries to assist them with their business, and soon one of these became a principal secretary. In the 16th century there were two of them, both members of the privy council; the most notable of these early secretaries was William Cecil, Lord Burghley, and in Elizabeth's time they were first called secretaries of state, and became members of parliament. The two divided the business between them, and after 1688 one looked after northern and the other after southern affairs.

In 1782 their duties were divided on a more workable plan, one taking charge of home, the other of foreign, affairs. In 1794 a third secretary of state was appointed to manage certain military affairs, and in 1801 he took over the charge of colonial business. In 1854 these two functions were separated and a fourth secretary was appointed. The fifth secretary of state was appointed to manage the affairs of India after the dissolution of the East India co. in 1858, but this office ceased to exist 1947-48. From 1707 to 1746 there was a secretary of state for Scotland, and from 1768 to 1782 one for colonial affairs, this being terminated when the American colonies became independent. Since 1926 the secretary for Scotland has been again a secretary of state.

In the U.S.A. the secretary of state is the chief of the dept. of state, the most important of the executive depts. of the U.S. govt.; his functions roughly correspond with those of the British secretary of state for foreign affairs.

Secret Service. Department maintained by the govts. of most countries to make inquiries into political, criminal, or other matters and to obtain details of activities, domestic or foreign, likely to be prejudicial to state security. In

Great Britain, branches of the secret service operate as intelligence on behalf of the three fighting services, while the branch working for the Foreign office is called political intelligence. Funds are provided by parliament under a secret service vote; this was formerly a token estimate of £100, further expenditure being met from the vote of credit, but in 1946 parliament began to vote annually £2,500,000 for secret service. In the U.S.A. the secret service dept. has a wider sphere of activity and is the authority for detecting civil crime and fraud against the federal govt., and for enforcing federal, as distinct from state, laws. *See* Espionage. *Consult* Secret Service, G. Aston, 1930; Secret War, T. M. Johnson, 1930.

Secret Session. Meeting of the British parliament from which press and public were excluded, held under the authority of the Speaker in times of emergency, e.g. during both Great Wars. During the Second Great War some 30 secret sessions were held on matters of military and foreign policy. For the subject matter of these sessions *consult* Secret Session Speeches, W. S. Churchill, 1946.

Secret Society. Body of persons concealing from outsiders its membership, tenets, aims, or activities. Such societies are of the most various kinds, the motive of secrecy being to safeguard members against persecution, to pursue a common object respecting which publicity is undesirable, to maintain caste privilege, or merely to surround members with an air of mystery. Initiation rites are frequent, often including a symbolic death and resurrection, and passwords or other signs of recognition are used. The aims are religious, military, disciplinary, etc.

The societies connected with the mysteries of ancient Greece, Asia Minor, and Egypt, link primitive secret societies with later religious organizations. In medieval Europe, as in the East today, an element of secrecy belonged to most religious and political societies. Chinese secret societies appear to lack the religious and magical elements, and pursue revolutionary or anti-European aims. *See* Assassins; Carbonari; Cathari; Freemasonry; Illuminati; Initiation; Ku Klux Klan; Mafia; Mystery; Rosicrucians; Thugs; Totemism; Voodoo.

Secret Weapon. Term used by the Germans in the Second Great War to describe any new weapon of unorthodox design, the use of

which, it was claimed, would bring the conflict to a sudden and successful conclusion.

Hitler first claimed possession of a secret weapon in a speech suggesting that the Allies come to terms after the conquest of Poland. This was the magnetic mine used against British shipping a few months later. Other weapons claimed as secret were radio-controlled midget tanks, containing 1,000 lb. of explosives and used on the Russian front; self-propelled armoured torpedo boats unsuccessfully used against Allied shipping at the Normandy landings; rocket-propelled interceptor aircraft; the V1 flying bomb; and the V2 rocket.

Flying bomb and rocket did constitute a serious threat, and the Allied air forces engaged in prolonged operations to hinder their development and production. Knowledge of their existence undoubtedly swayed Eisenhower's decision to invade the Continent in spite of the unpropitious weather in June, 1944. Germany's diversion of industry and research to the production of such weapons was at the expense of the Luftwaffe in particular; it proved detrimental to her military situation and shortened her resistance.

Section (Lat. *secare*, to cut). Literally, something cut off, and therefore a portion. The word is used for the surface formed when a solid is cut by a plane. In architecture a sectional drawing shows the plan or elevation of a building as cut by a plane to expose the proportions and details of the structure. In military language a section is a division of a larger unit, e.g. a section of an infantry platoon.

Sector. In geometry, a portion of a circle enclosed between the arc of a circle and the two radii to its extremities from the centre. Its area is half the product of the radius of the circle and the length of the arc. (*See* Circle.)

In its military sense, the term sector describes a small section of an operational area, generally defined by topographical features. In the civil defence system of the U.K. during the Second Great War, areas of towns and cities were divided into sectors, each in charge of a warden.

Secular (late Lat. *saeculum*, the world). Term used at one time to denote all things outside the Church. It was later applied to clergy who worked among the people and were not bound by monastic vows or rules. Hence the phrase secular clergy, or secu-

lar priesthood. The word is also used in a geological sense to mean occurring once in, or lasting for, a long period of time.

Secular Games (Lat. *Ludi Saeculares*). Festival of ancient Rome, lasting three days, celebrated at intervals of 100 to 110 years. Horace's well-known ode, the *Carmen Saeculare*, was written on the occasion of the celebration of the games in the time of the emperor Augustus. See *Ludi*.

Secularism (Lat. *saeculum*, age, generation; late Latin, world). Philosophical system which limits the destiny of man to the present life. It was founded in England by G. J. Holyoake (*q.v.*). The avowed object of its members was to live and die for the world and to work for the welfare of man. Dogmatically, its position was negative; it denied the arguments for the existence of a God, a divine government of the world, or a future life. If there were a future life, those who had done their best to assist their fellows in this world would find their reward; if there were not, it would be foolish not to enjoy oneself while one could. At the same time, secularists denied that they were atheists and called themselves non-theists, as being unconcerned about the question of God. They may thus be called utilitarians and agnostics, the name which later secularists preferred.

While Holyoake was the chief spirit of the movement, its character on the whole was unaggressive; but under Charles Bradlaugh (*q.v.*) it was distinguished by excessive radicalism and a bitter hostility to religion in any form. During the present century secularism has been little heard of as a distinct sect, its activities having been apparently merged in some of the numerous ethical societies. The institution of a kind of religious ceremonial in accordance with a set of rules called the Holyoake Ritual and other points of resemblance to the philosophical system of Comte caused it to be said that secularism was nothing but a translation of French positivism. See *Agnosticism*; *Freethought*; *Positivism*; *Rationalism*.

Secular Variation. Term in statistics to denote the persistency of a variate to increase or decrease with time. Before this becomes apparent it may be necessary to subject the data to a smoothing treatment to remove the masking effect of variation over shorter periods. An example is the general upward trend of winter temperatures over N.W. Europe

which began about 1900; but the occurrence of a series of cold winters during 1940-42 and in 1947 indicates that it is not certain this trend will continue.

Secunderabad OR **SIKANDARABAD**. Former British military cantonment of Hyderabad, which was administratively part of the capital city 6 m. to the S.W. One of the largest British military stations in India, it had an immense parade ground on which 7,000 troops could be manoeuvred with ease. British troops were withdrawn in 1947 when the administration of the town was handed over to the nizam of Hyderabad, who maintained it as a garrison during the brief invasion by India's forces in Sept., 1948. See *Hyderabad*.

Security (Lat. *securitas*, freedom from anxiety). Originally having the meaning of the Latin word, security came to have the derived sense of something deposited as a guarantee that a debt will be paid; hence, a document, e.g. bond or stock certificate giving evidence of debt or of property. Securities of this kind are frequently accepted by banks, etc., from customers who desire an overdraft. The word is contracted as *surety* (*q.v.*). See *Guarantee*; *Social Security*.

Security. Term for an organization that has as its object the protection of a nation's interests, particularly in wartime. In the Second Great War, all belligerents enforced stringent security measures; in Great Britain these were mainly the responsibility of the military intelligence department, M.I.5. Besides their work in counter-espionage and the suppression of fifth-column activities, the security authorities ran a campaign against careless talk about defence measures. Censorship of civilian and service correspondence was an essential security measure, and at some airfields and military establishments it was a practice to forbid outward postal, telephone, or telegraph traffic, except of official nature, for some time before major operations.

Extra security measures imposed upon the threat of German invasion included the removal of signposts, the closing of certain coastal areas, and restrictions on the use of vehicles. Precautions during the concentration and transport of troops destined for French N. Africa enabled landings to be carried out with the maximum element of surprise. The Allied invasion of Europe on June

6, 1944, took place without the enemy's having certain knowledge of the point of attack.

Security police accompanied the armies in the field to counter the activities of enemy agents. Lack of them in the campaign in France in 1940 allowed enemy tactics to confuse the Allied retreat. When the Allies entered Germany in 1945, field security police examined German police and officials before permitting them to continue duty.

After the war, the development of atomic research for pacific application was seriously hampered and much of it duplicated because security restrictions prevented the free interchange of knowledge. In 1948 the British govt. announced that members of the Communist or fascist parties in the employment of the state would be removed from work vital to national security. In the U.S.A. federal security authorities began investigation into the activities of Communists alleged to be dangerous to national security. See *Espionage*; *Intelligence*, *Military*; *Secret Service*.

Security Council. One of the five chief sections of the United Nations organization. It consists of eleven member nations, of which Great Britain, the U.S.A., France, China, and the U.S.S.R. are permanent members, while the six non-permanent nations are elected each for a two-year term. The council is responsible primarily for the maintenance of international peace and security. Decisions on questions of procedure are by affirmative vote of seven members, but on all other questions must carry the votes of all permanent members. The council is assisted by an advisory military staff committee. See *Veto*.

Sedaine, MICHEL JEAN (1719-97). French dramatist. Born in Paris, July 4, 1719, and early left fatherless, he worked as a mason's labourer before being befriended by an architect who received him as a pupil. Developing his literary gift, he wrote the libretti of several light operas. Like his friend Diderot, he believed it possible to import the emotional interest of tragedy into the realistic framework of comedy, and his *Philosophe Sans le Savoir* is the best 18th century contribution to serious comedy. An academician from 1786, Sedaine died May 17, 1797.

Sedalia. City of Missouri, U.S.A., the co. seat of Pettis co. It is 82 m. E. by S. of Kansas City, with which it has rly. connexion. Sedalia newspapers, which reflect

the traditions of the Mark Twain era, have proved a training ground for successful journalists. Sedalia, which has rly. workshops and large packing houses, was incorporated as a town in 1864, and chartered as a city in 1889. Pop. 20,428.

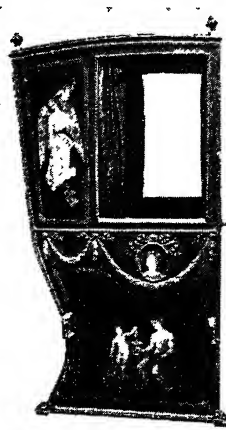
Sedan. Town of France. It is on the right bank of the Meuse, 164 m. N.E. of Paris, in the dept. of Ardennes, and is chiefly famed as a fortress. It has woollen and cloth factories, metal and dye works. It was a Protestant centre after the Reformation, and owed its prosperity to the Huguenots. At its theological seminary, Andrew Melville, Scottish theologian, was a teacher. Here also was born Turenne. The battle of 1870 is described below. Occupied by the Germans throughout the First Great War, Sedan was captured by French and American troops just before the armistice of 1918. It fell again to the Germans on May 15, 1940, several bridges over the Meuse near the town having been left intact by the defenders. On Aug. 31, 1944, units of the U.S. 1st army entered the town unopposed. Pop. 13,514.

Sedan, CAMPAIGN OF. German success over France in 1870. The campaign began when MacMahon assembled an army of 150,000 men at Châlons. He wished to move it on Paris, but his judgement was overruled, and he was ordered to join up with Bazaine, still at Metz. Napoleon III accompanied the army, which began its march Aug. 21. The German plans were to prevent Bazaine breaking out of Metz, while continuing the march on Paris in sufficient force to meet the Châlons army. By Aug. 30 the French had been caught up at Beaumont, while still on the left bank of the Meuse. Although unprepared, the rearguard fought well and was withdrawn with skill, but 3,000 prisoners and 51 guns were captured. The French spent the night of the 30th and up to mid-day on the 31st in a confused concentration round Sedan. On the night of the 30th both the pursuing German armies were directed to continue northward.

The 3rd German army moved directly on Sedan from the S., its left wing crossing the Meuse at Donchery, while connexion with the army of the Meuse was maintained by the Bavarians. On Sept. 1, Moltke, expecting that the

French would continue the retreat, gave orders for the attack to be pressed at day-break, by the Meuse army from the E. and the Bavarians from the S., while the left wing of the 3rd army pushed N. to prevent a retreat on Belgium. MacMahon was wounded in the early morning, and handed over the command to Ducrot, who at 7 a.m. ordered a retreat. Scarcely had the retirement begun when Wimpffen produced an order from Paris, directing him to succeed MacMahon, and he stopped the retreat.

Meanwhile the German right was closing round the Châlons army. Long lines of artillery were coming into action on each side, and the huddled Frenchmen in the centre were being slaughtered wholesale. The Guard, now in touch with the 3rd army, at 5 p.m. carried the Bois de la Garenne, and the battle was practically over. Fugitives from all sides were crowding into Sedan. German guns



Sedan Chair. Type used in the period of Louis XVI

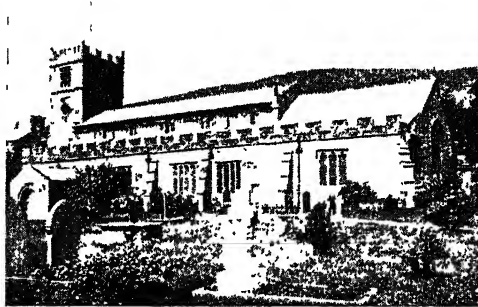
vented, it was introduced into England by the duke of Buckingham in the reign of James I. A patent was granted in 1634 for the right to hire out covered chairs in London, and they soon became generally popular, and their use lingered on till early in the 19th century. Usually the door was in front, between the poles; often the roof lifted to enable ladies with high headdresses to enter without danger of disarranging them.

Sedative (Lat. *sedare*, to settle, allay). Drug used to calm restlessness or excitement, or to produce sleep. Any degree of effect from slight soothing to deep coma can be obtained with the barbiturate drugs. Bromides and chloral hydrate are also important sedatives.

Sedbergh. Market town of the W. Riding of Yorks, England. It is situated 9 m. E. of Kendal, and is on the Rawthey, with a station on a branch rly. between Ingleton and Tobay. The chief

building is the ancient church of S. Andrew. There are some manufactures, and cattle fairs are held. Around are the moors and hills which culminate in Wharfedale. Market day, Wed. Pop. 2,250.

Sedbergh School. English public school. It was founded in 1525 by Roger Lupton, provost of Eton, and was



Sedbergh, Yorkshire. Parish church of S. Andrew

were starting conflagrations there, and the Bavarians were starting an assault on the Torcy gate, when the flag of surrender was hoisted by the emperor's orders. The victory cost the Germans 9,000 casualties and the French 17,000, but Napoleon III and 104,000 officers and men became prisoners of war. See Franco-Prussian War; Moltke; Napoleon III.

Sedan Chair. Enclosed armchair carried by bearers by means of poles passed through rings or supports in the side of the vehicle. So called from Sedan in France, where it was said to have been in-

vented, it was introduced into England by the duke of Buckingham in the reign of James I. A patent was granted in 1634 for the right to hire out covered chairs in London, and they soon became generally popular, and their use lingered on till early in the 19th century. Usually the door was in front, between the poles; often the roof lifted to enable ladies with high headdresses to enter without danger of disarranging them.

Seddon, FREDERICK HENRY (d. 1912). British poisoner. In July, 1910, a Miss Barrow went to lodge

with Seddon, an insurance agent, at Tollington Park, London. Gradually he obtained possession of all her property, more than £4,000 in shares and cash, giving her in exchange an annuity. On Sept. 14, 1911, she died and was hurriedly buried in a public grave, Seddon representing that her remaining possessions were worth only £15. Her relatives had not been informed of her death, and, becoming suspicious, they got permission for her body to be exhumed, when Miss Barrow was found to have died from arsenic poisoning. Seddon was proved to have purchased six fly-papers, each containing more than enough arsenic to kill an adult person. Immediately after the death he made payments of £150 in gold which could not be accounted for by his bank book. Seddon was found guilty of murder and hanged in Pentonville, April 18, 1912.

Seddon, RICHARD JOHN (1845-1906). British-born New Zealand statesman. Born at St. Helens, Lancashire, June 22, 1845, the son of a schoolmaster, he became an engineering apprentice, but in 1863 went out to the Australian gold-fields, and for some time lived a roving life. Prosperity began when he opened a store in New Zealand. In 1874 he transferred this to Kumara, where he became prominent in local affairs, and in 1881 was elected to the New Zealand legislature. Joining the Liberals, he was for nine years an active private member. In 1890 he was made a minister, and in 1893 he succeeded John Ballance as premier. He held that position until his death, and was also the head of several of the most important departments of state: finance, defence, labour, mines, public works, and trade at one time or another, generally three or four together. He introduced old-age pensions, women's suffrage, local option, and land taxes, and nationalised mines and the fire insurance business. He was also a strong imperialist, gave practical support to the imperial navy, and favoured tariff reform based on colonial preference. He died June 10, 1906.

Sedentary Deposits. In geology, sedimentary deposits which have been formed and left in their place of formation without having been transported. Many soils are typical sedentary deposits, and other products of weathering such as bauxite and laterite are included under the term.

Sed Festival. Ritual custom observed periodically in ancient

Egypt, perhaps of astrological origin. According to another view the prehistoric Egyptians ceremonially slew their kings, actually or symbolically, after a certain number of years, as some Nilotic tribes still do. Hence arose the practice of identifying the king with Osiris, and sometimes of investing the crown prince with a *sed*, or tail, to establish his status. In the XXIInd dynasty Osorkon II, c. 858 B.C., reconstructed at Bubastis a stately edifice called the Hall of the Sed Festival, whose portal was sculptured with scenic representations of the attendant ceremonies.

Sedge (*Carex*). Extensive genus of perennial tufted herbs of the family Cyperaceae. They are



Sedge. Grass-like leaves and flower spikelets of *C. pseudo-cyperus*

The male and female flowers are separate, but both kinds are usually included in the same spikelet. The fruit is a minute leathery nut. The tissues are used in paper-making. The underground stems are sometimes used for food; those of the European *C. arenaria* have been used for sarsaparilla.

Sedgefield. Market town of Durham, England. It is 9 m. N.N.W. of Stockton-on-Tees, with which it is connected by rly. The buildings include the parish church, an Early English building of the 11th century. Near by is the only racecourse in the county. Cattle markets are held. Pop. est. 4,200.

Sedgemoor, BATTLE OF. Fought July 6, 1685, between the troops of James II and those of the duke of Monmouth. On June 11, 1685, the duke landed at Lyme Regis and, gathering recruits as he marched, was greeted with extraordinary warmth at Taunton. Thrice he marched towards Bristol, but soon turned, and by a circuitous route made his way to Bridgwater, having thus given the king's generals time to assemble a force.

On Sunday, July 5, 1685, the royal troops, 2,500 regulars, and about 1,500 militia, were on the plain of Sedgemoor, just outside Bridgwater. The earl of Feversham was in command, while under him was John Churchill. Monmouth decided on a night attack. He himself led the foot, and in the darkness they set out along a route taking them to the moor. All went well until they reached an unexpected ditch, where a pistol went off, giving the alarm.

Many of Monmouth's horsemen fled at once from the field; but his foot, though mainly peasants badly armed, offered a stout resistance. At length their ammunition was exhausted, while, after a delay, horses were found to drag the royalist cannon to the scene. Their fire decided the issue, and before the morning Monmouth's routed army was pouring back into Bridgwater. Their leader had already fled, and a terrible revenge was taken by the victors. The rebels, perhaps 5,000 strong, had 1,000 killed; the royalists about 300. Consult S. and the Bloody Assize, C. D. Curtis, 1930.

Sedgley. Urban dist. of Staffs, England. It is 3 m. S. of Wolverhampton and has a rly. station. The industries are those of the Black Country, collieries, fire-clay fields, limestone quarries, and ironworks, and the making of hardware. Pop. est. 19,000.

Sedgwick, ADAM (1785-1873). British geologist. Born March 22, 1785, at Dent, Yorkshire, and educated at Sedburgh and Trinity College, Cambridge, he became a fellow, 1810. He was elected to the Woodwardian professorship of geology, 1818, though



Adam Sedgwick, British geologist

ignorant of the subject, but he studied it with such energy that he was able to begin a course of lectures in 1819, which rapidly became famous. President of the Geological Society 1831, he was awarded the Wollaston medal, 1851.

Sedgwick travelled extensively in Great Britain making geological studies, and several times on the Continent with Murchison (*q.v.*). He became an authority on Palaeozoic rocks. Died Jan. 27, 1873.

Sedilia (Lat. *sedile*, scat). In church architecture, term applied to recessed and decorated seats with canopies, reserved for the

officiating clergy. Three in number, they are near the altar.

Sedimentary Rocks. In geology, rocks deposited one above the other in strata. They include sandstone, shale, limestone, coal, and salt deposits. They are commonly laid down in the sea; but some, such as ancient desert sands or river deposits, were deposited on land, being said to have a continental origin.

Mechanically formed sediments are those derived from broken or ground-up fragments or minerals of earlier rocks, being termed terrigenous. Rocks containing fragments above 2 mm. diam. are termed breccias if the fragments are angular, or conglomerates if rounded, e.g. pebble-beds, and pudding-stone. Coarse angular sands form grit, or gritstone, fine sands form sandstones. Fine muds on consolidation yield first clay, then as they harden mudstone, or, if the rock is laminated, shale.

Organically formed sediments are those derived from the accumulation of animal or vegetable remains, or from mineral matter secreted by animals. Thus coal, peat, and lignite, are accumulations of vegetable matter which owing to conditions at the time of their formation have not decayed, but have been preserved. Limestones composed of shell fragments, old coral reefs, etc., are also considered as being of organic origin.

Chemically formed sediments result from the precipitation of material from solution. Many limestones, particularly oolitic limestones, are formed this way. Calcium carbonate from hot or cold springs—travertine or tufa respectively—are the direct results of such precipitation. Salt, gypsum, magnesium, and potassium salts are produced by the evaporation of salt water, and are the best examples of chemically formed sediments.

The original components of sedimentary rocks are loose and unconsolidated, as can be seen on any seashore. With time and burial beneath later sediments the material becomes compressed, water squeezed out, and other minerals are deposited, forming a cement in the interstices between the grains. The degree of consolidation varies greatly, and is not wholly dependant on age.

The age of many sediments can be determined by their fossil content (see Fossils); and from the character of the fossils and the nature of the rock it is possible to

deduce whether the sediments were laid down on land, near shore, or in deep water. Comparison with rocks of the same age in other areas thus permits the delineation of ancient seashores, land areas, or zones of deep water. This is a branch of geology known as palaeogeography.

Sediments are of great economic importance. Many sandstones and limestones are extensively used as building stones. Most slates are derived from shales or mudstones. Limestones or chalk together with clays are used for cement, and bricks are made from clay. Some sedimentary beds are important sources of water, and artesian wells are supplied from them. Much iron ore, all coal, and petroleum are direct products of sedimentation. See Geology; Rock. Consult Principles of Physical Geology, A. Holmes, 1944; The Petrology of the Sedimentary Rocks, F. H. Hatch, R. H. Rastall, and M. Black, 1938.

Gilbert Wilson, Ph.D

Sedition (Lat. *seditio*, civil discord). In the British Empire, an offence against the crown and government, differing from treason in that it is not capital. It includes any attempt to bring into contempt or hatred the person of the reigning monarch, or the government and constitution of the U.K. as by law established, or either house of parliament; or to incite his majesty's subjects to attempt the alteration of any matter in church or state otherwise than by lawful means. It is also sedition to raise discontent or disaffection amongst his majesty's subjects, or to promote hostility and ill-will between different classes.

Prosecutions for sedition and more particularly for sedition by words—i.e. seditious libel—were frequent in the 18th and early 19th centuries, it being held at that time that any criticism of the govt. was sedition. This principle was carried to extreme lengths, and in 1758 one John Shebbeare was sent to prison for criticising William III and George I, then long since dead. The law of seditious libel was thus a serious obstacle to the freedom of the press. It is, however, now established that it is permissible to point out errors in the govt. or the constitution with a view to their reformation. There had been no prosecutions for seditious libel for nearly 100 years before 1947, when a newspaper editor was charged on the ground that an article written by him was anti-Semitic and intended to promote violence by

stirring up hostility between different classes of his majesty's subjects. He was acquitted.

Sedley, Sir Charles (c. 1639–1701). English dramatist and wit. Born at Aylesford, Kent, and educated at Wad-



Sir Charles Sedley,
English dramatist

ham College, Oxford, he earned a great reputation as a wit when he entered London society and one equally great for profligacy. He

wrote two tragedies and three comedies, of which the comedy *Bellamira*, 1687, founded on the *Eunuchus* of Terence, is the best. His poetry has little merit, though his lyric *Phyllis is My Only Joy* is still remembered. Sedley died Aug. 20, 1701.

Sedley, Amelia. Heroine of *Vanity Fair*, by W. M. Thackeray. The daughter of worthy, middle-class parents, she acts as a foil to the designing Becky Sharp whom at first she befriends, and whom she introduces to her family. She marries George Osborne only to discover after his death that Becky has been his mistress. She eventually marries the benevolent and faithful Major Dobbin. Her brother Joseph, familiarly known as Jos, is represented as a good-natured but valetudinarian servant of the East India co. on whom Becky fastens when all else fails.

Seduction (Lat. *seducere*, to lead astray). The act of inducing a girl or woman to part with her virtue. In English law the parent of a person seduced may be entitled to claim damages from the seducer. The cause of action arises, however, not from any injury to the parent's feelings, but from the financial loss it is presumed he has incurred through being deprived of his daughter's services by a confinement following seduction. This is part of the larger principle under which a master is entitled to claim damages from a person depriving him of the services of a servant. A father can therefore claim damages only if he can show that his daughter rendered him services; but in practice very slight evidence of service will suffice, e.g. making the parent a cup of tea. The damages are not limited to the value of these services.

Sedum or **STONECROP.** Genus of succulent herbs of the family Crassulaceae. There are 150 known species, chiefly of the Old World. Eleven are natives of Great

Britain, including rose-root (*S. rhodiola*), orpine (*S. telephium*), and the common stonecrop (*S. acre*). The flowers of the last are starlike, and brilliant yellow; it grows on roofs and walls, or by the seashore. See Rock Plants.

See. Word meaning literally a seat. It came to be used especially for the throne, or seat, of a bishop, and therefore for the cathedral city. A later extension made it a synonym for diocese (*q.v.*).

Seed. In botany, a fertilised and ripened ovule containing an embryo plant. Seeds develop in many different forms. Some, as nuts, are contained in a case of almost stony hardness; others, as the milkweeds, are covered with silky hair; others again, *e.g.* those of the date, apple, or yew tree, are enclosed in fruity pulp. In all the covering is such as will best tend towards the dispersion or survival of its contents.

In the leguminous plants the pods, when dry, twist and scatter the seeds. The fleshy fruits, as the strawberry, are eaten by birds or mammals, and the seeds passing uninjured through the digestive organs are widely distributed. The so-called "burr" seeds are provided with hooked spines, which catch in the coats of passing animals, and in this way are carried to a distance. Many seeds are distributed by the wind. Some trees, as the elm and ash, have winged seeds which drift a long way from the parent tree.

Seeds vary enormously in rapidity of germination. Some germinate within a few days of sowing; others, such as the hard-shelled seeds of ash, hazel, hawthorn, or holly, do not sprout until 18 months after ripening. Again, some seeds can be kept for years without losing their power of germination, while others are dead within 12 months or less. Seed-testing stations have been established in almost every civilized country, where seedsmen can have samples of seeds tested and receive guarantees of purity and germination. In Great Britain the examination of samples is undertaken by the ministry of Agriculture, county agricultural organizers, most agricultural colleges, and the agricultural departments of universities.

On the sale of most agricultural and garden seeds the seller must deliver to the purchaser a written statement containing particulars as to variety, purity, and germination. The particulars as to germination must be based on a

test which must have been made at a testing station licensed by the ministry of Agriculture. See Botany; Fruit; Plant.

Seeding. Device used in making the draw for a knock-out competition in athletics. Those regarded as the best competitors have their names placed in various sections of the draw so that, should they come through their earlier matches, they will not meet one another until a late round of the event. Wimbledon lawn tennis provides the best-known example of this practice.

Seeds, SIR WILLIAM (b. 1882). British diplomatist. Born June 27, 1882, he went to Rugby and entered the diplomatic service in 1904. Having been high commissioner in the neutralised Rhineland, 1928-30, he was for the next five years ambassador to Brazil, but is chiefly remembered as ambassador to the U.S.S.R. in 1939-40 before Sir S. Cripps. Seeds was made K.C.M.G. in 1930.

Seeley, SIR JOHN ROBERT (1834-95). British historian. Born in London, Sept. 10, 1834, the son of a publisher and author, he was educated at the City of London school and at Christ's College, Cambridge, where he became fellow and lecturer. He was professor of



Sir J. R. Seeley,
British historian

Latin at University College, London, 1863, and regius professor of modern history at Cambridge from 1869 until his death, Jan. 13, 1895. He was made K.C.M.G., 1894.

Seeley regarded history as the science of the state, as a study of the inception and development of policies and tendencies rather than of the deeds of individuals. It was a somewhat narrow view, but Seeley was its greatest exponent, and his work shows him as a deep and accurate thinker. His *Expansion of England*, 1883, and *Growth of British Policy*, 1895, are written on these lines. His first book, however, was of a different kind; in 1865 he wrote anonymously *Ecce Homo*, a study of Jesus Christ as a man of astonishing influence but not a divine being. Seeley also produced *The Life and Times of Stein*, 1879, and a short *Life of Napoleon*, 1886. His suggestive lectures, *Introduction to Political Science*, appeared after his death.

Seeley, JOHN EDWARD BERNARD. This British politician, who was secretary for war 1912-14, is noticed under Mottistone, the name he assumed on being raised to the peerage.

Seferis, GEORGE (b. 1900). Greek poet. Born at Smyrna (Izmir), and educated in Athens, he studied law in Paris, then entered the Greek diplomatic service, acting as vice-consul in London, 1931-34, and consul in Albania 1936-38. During the Second Great War he was press liaison officer for the Greek govt. in Cairo, and first secretary at the Greek embassy in Pretoria. In 1945-46 he was *chef de cabinet* to the regent Damaskinos. He established a reputation with the publication, 1932, of a collection of poems, *The Turning Point*. This was followed by *Mythistorama* (*Myth of Our History*), 1934; *Gymnopedias* (*Book of Exercises*), 1936. In its affection for tradition, blended with modernist style, his work has been likened to that of T. S. Eliot; and the sympathy between the two is evident, for Seferis translated into Greek many of Eliot's poems. A representative selection of his works was translated into English by B. Spencer, N. Valaoritis, and L. Durrell, under the title *The King of Asine*, 1948.

Sefton, EARL OF. Irish title held by the Molyneux family since 1771. Representative of an ancient family of Lancashire, Sir Richard Molyneux was made Viscount Molyneux in 1628. His son Richard, 2nd viscount, a royalist who fought for Charles I at Worcester, died childless, and was succeeded by his brother Caryl. The succession passed in due course to William, who was created earl of Sefton in 1771. His son Philip (1772-1838), 2nd earl, was in 1831 made Baron Sefton, by which title the earls sit in the house of lords. Hugh (b. 1898), 7th earl, succeeded his father in 1930. He was lord-in-waiting to the king in 1936-37 and lord mayor of Liverpool 1944-45. His chief seat is Croxteth Hall, Liverpool.

Sefton Park. Suburb of S.E. Liverpool, England. It has a rly. station. The park itself is one of the finest open spaces in the city, covers 269 acres, and contains a lake, a palm house, and an aviary. See Liverpool.

Seger Cones. Standard materials used in determining the softening temperatures of refractory materials (*q.v.*).

Segesta OR **EGESTA**. Ancient Greek city in N.W. Sicily. It was situated on Mt. Varvaro, 2 m. N. of the site of the modern Calatafimi. Segesta was allied with Athens, 454 B.C., became subject to Syracuse in 307 B.C., and was allied with Rome after the First Punic War. The place is now entirely deserted. There are remains of city walls, an incomplete Doric temple, and a rock-cut theatre.

Segni. Town of Central Italy, in the prov. of Rome. The ancient Signia, it is situated 33 m. S.E. of Rome on a spur of Monti Lepini, 2,190 ft. Several gateways in portions of the ancient cyclopean walls are well preserved. The modern town occupies the lower portion of the old site. Pop. 7,000.

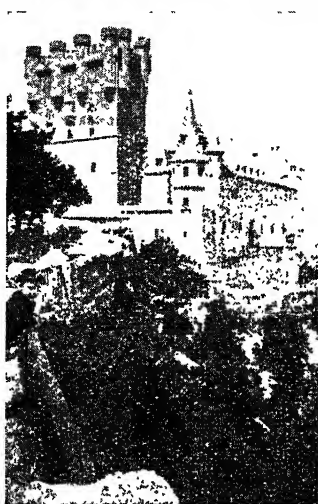
Sego OR **SEGOZERO**. Lake in the Karelo-Finnish S.S.R., 30 m. N.W. of Lake Onega. It is 25 m. long and 20 wide, and abounds in fish.

Segou OR **SEGU**. French town on the river Niger. In French Sudan, it is 400 m. S.W. of Timbuktu. Pop. 22,150.

Segovia, **WANKS**, OR **COCO**. River of Central America. It rises in the W. of Nicaragua, and along its lower course forms the boundary between that state and Honduras, entering the Caribbean Sea near Cape Gracias á Dios. Small vessels penetrate 150 m. from the delta.

Segovia. Province of Central Spain. It slopes to the N.W. from the forested Sierra de Guadarrama, and is mainly an arid plateau drained by the tributaries of the Douro. Cattle, sheep, swine, and mules are reared; wheat, hemp, and flax are cultivated with the help of extensive irrigation schemes. Marble and granite are quarried. Its area is 2,682 sq. m. Pop. 199,649.

Segovia. A city of Central Spain, in the prov. of Segovia. It is 63 m. by rly. N.N.W. of Madrid. The old town is a decayed city, surrounded by a well preserved wall with 86 towers and set upon a hill crowned with a castle, the Alcázar, and a 16th century Gothic cathedral. A Roman aqueduct, 2,700 ft. long, built in the time of Trajan, is still used to convey water; its central portion consists of a double tier of arches, and is the largest and best preserved structure of its kind in Spain. Many ancient churches, palaces, and houses maintain a venerable aspect. In medieval times Segovia was the residence of the court of Castile; in 1474 Isa-



Segovia, Spain. Keep of the Alcázar

bella of Castile was crowned in the Alcázar. Museums, picture galleries, and libraries house many collections of archives. There are mills and factories. Pop. 16,500.

Segovia, **ANDRÉS** (b. 1894). Spanish guitarist. Born at Jaén, Feb. 18, 1894, he was chiefly self-taught, and after giving recitals in Spain, played in the chief cities of Europe and N. and S. America, achieving an international reputation from the 1920s by masterly interpretation and technique.

Segrave, **SIR HENRY O'NEAL DEHANE** (1896-1930). British racing motorist. Born at Baltimore, Md., U.S.A., Dec. 22, 1896, of Irish parents, he went to Eton and Sandhurst, served in France in the First Great War, and went on an aviation mission to Washington in 1918. He took up motor racing and made many attempts at speed records; he exceeded 200 m.p.h. at Daytona, Fla., in 1926, and raised this to 231-362 in his car Golden Arrow in 1929, being knighted on that achievement. On Lake Windermere, June 13, 1930, he was killed in his motor boat Miss England II after it had broken the world speed record for that craft. His *Life*, by J. W. Day, was written in 1930.

Segrave Trophy. A British trophy awarded annually for outstanding achievements in sea, air, and land transport. Established in 1930 as a memorial to Sir Henry Segrave (*v.s.*), it is made to the British subject who, in the opinion of a committee, accomplishes the outstanding demonstration of initiative, courage, and skill in furthering the development

of transport. Consideration is also given to the extent to which the vehicle is a product of the British Empire. The trophy was first given in 1930 to Kingsford-Smith for his England-Australia flight; in 1939 it went to Sir Malcolm Campbell for setting up a world speed record on water. Award was suspended during the Second Great War.

Segregation (from Lat. *segregare*, to set apart from a flock). Act of separating men or animals from others of the same kind. It is used sometimes when, as in the case of the Chinese introduced into the Transvaal in 1903, it is necessary to keep one part of the community apart from another.

In metallurgy and geology the term is applied to a particular form of separation in which metals or minerals separate from the mass in which they have been held and collect together. Thus when a steel ingot cools, carbon, phosphorus, and sulphur, and perhaps manganese and silicon, separate from the mass and tend to collect in that part of the ingot which cools last.

Seguidilla. A Spanish dance, the music being in triple time, and often in the minor mode. It is performed by two persons, and is accompanied by the guitar, to which may be added castanets, and the accompanists also sing couplets (*coplas*) at certain places. The Seguidilla is of three kinds: *Manchega*, lively; *Bolera*, more sedate; and *Gitana*, very slow. Nothing is known of its origin.

Séjur, **LOUIS PHILIPPE, COMTE DE** (1753-1830). French diplomatist and author. Born in Paris, Dec. 10, 1753, he served with Rochambeau's army in the American War of Independence and was afterwards French ambassador in St. Petersburg and Berlin. Though under the Restoration he became a peer, he retained his early liberal ideas to the end of his life. His works, which are written with spirit and grace of style, include *Histoire de Frédéric-Guillaume II*, *Histoire Universelle*, *Galérie Morale et Politique*, and *Mémoires*. Séjur died Aug. 27, 1830.

Segura. River of S.E. Spain. The ancient Tader, it rises in the Sierra de Segura in the prov. of Jaén, flows E. and S.E. past the city of Murcia, and enters the Mediterranean Sea 19 m. S.W. of Alicante after a course of 150 m. It traverses the provs. of Albacete, Murcia, and Alicante, and is unnavigable but useful as a source of irrigation water for the *huertas* or cultivated gardens.

Seiche (Fr. *sèche*, dry). Name given to the oscillations in the level of the surface of lakes or land-locked areas of the sea, explained by G. H. Darwin as long waves in relatively shallow water. Winds, local earthquakes, and probably atmospheric oscillations, recorded as waves by microbarographs, produce the phenomena. These apparent tides were first observed in Lake Geneva, where it was found that the rise and fall of the water ranged from a fraction of an inch to several ft., the periods varying between 20 and 40 mins. Some Scottish lochs exhibit another type of seiche; here waves have been observed in a layer below the surface in which there was a sudden change in temp. *Pron.* saysh.

Seidlitz Powder. Mixture of potassium and sodium tartrate and sodium bicarbonate wrapped in blue paper, and tartaric acid wrapped in white paper. The powder in the blue paper is dissolved in half a tumbler of warm water, and the powder in the white paper is then added, the mixture being taken while effervescing. It is a classical remedy for disorder of the liver or for the ill-effects of too much alcoholic liquor, and is best taken about half an hour before breakfast. The name is taken from the mineral spring of Seidlitz, in Bohemia, though the composition does not correspond to that of those waters.

Seigne, COL DE LA. Alpine pass on the border between France and Italy, S.S.W. of Mont Blanc. A bridge path connecting Chamonix and Courmayeur, it reaches an altitude of 8,245 ft. at the summit, where a shelter hut and a cross mark the frontier.

Seigniorage (old French). Something claimed by sovereign prerogative. Specifically, it means a royalty or prerogative of the crown by which a deduction is claimed from gold and silver bullion brought to the Mint in exchange for coined money. In modern times the proceeds of seigniorage go into the exchequer.

Seignobos, CHARLES (1854-1942). French historian. Born at Lamastre, Ardèche, Sept. 10, 1854, he was educated at the lycée of Tournon, and the École Normale, and studied in Germany, 1877-79. In 1879 he became professor at Dijon and joined the staff of the Sorbonne in 1883, later becoming professor of modern history. His historical works, most of which have been translated into English, include his *Histoire de la Civilisation*, 1884-86; *Scènes et Episodes*

de l'Histoire Nationale, 1890; *Histoire Politique de l'Europe Contemporaine*, 1897; *Histoire Comparée des Peuples de l'Europe*, 1938. His death was announced May 2, 1942. *Pron.* Sane-yo-bo.

Seine. River of France. It rises in the dept. of Côte d'Or, and flows generally N.N.W. for 482 m. to the English Channel. Between Nancy in the N.E. and Nevers in the S.W. stretches an upland area, known in the E. as the Plateau of Langres; the steep scarp slope faces S.E. to the Saône valley, and is known as the Côte d'Or S.W. of Dijon. Down the gentle slope N.W. to the Paris basin flow three large streams, the Marne, the Seine, and the Yonne, which have carved their way across the different strata of the basin to converge on Paris.

The Seine rises N.W. of Dijon, and flows N.W. from the plateau, past Troyes, to its junction with the Aube, a smaller stream, which flows similarly N.W.; thence the combined stream flows S.W. to the confluence with the Yonne above Fontainebleau. The Yonne has meanwhile received a right-bank tributary, the Armançon, which like the Aube drains the plateau. The Marne, farther E., has a similar tributary, the Ornain, which flows past Bar-le-Duc. Just before the Seine reaches Fontainebleau, it is joined on the left by the Loing, and from the confluence the Seine flows N.W. to receive the Marne just before it reaches Paris. The Marne flows in a curve past Châlons, Épernay, and Meaux, and is fed by the Grand Morin from the left. N. of Bar-le-Duc rises the Aisne, which follows a course roughly parallel to that of the Marne, and passes Soissons almost to Compiègne, having received from the left the Vesle, on which stands Reims. Above Compiègne the Aisne joins the Oise, which flows S.W. from just within the Belgian frontier, to reach the Seine below Paris. From the Oise confluence the Seine flows N.W. past Rouen to the estuary at Havre, receiving short tributaries from both sides, the longest being the Eure, on which stands Chartres. Below Paris the Seine has a strikingly tortuous course.

This concentration of waterways on Paris has become the basis of a great system of canals. From Havre by the Seine itself; from Dunkirk and the industrial towns of N.E. France and Belgium; by the St. Quentin canal and the canalised Oise; from Liège by the Sambre and Oise; from Strasbourg on the Rhine and the Saar

basin *via* Nancy, and canalised reaches of the Marne, Aisne, and Oise; from Alsace by the Doubs and *via* Dijon; from the Rhône-Saône valley by canal to the Loire, and thence by canal past Nemours, barges find their way to Paris. Havre is a great port; small ships reach Rouen, and barges reach Paris by the Seine.

During the campaign of 1940 in France German forces crossed the Seine near Vernon on June 12, and on June 14 occupied Paris. During Aug., 1944, when German columns were retreating E. before the advancing Allies, the Allied air force maintained a non-stop attack on the Seine crossings. The U.S. 3rd army had established a bridgehead across the river by Aug. 19, between Mantes-Gassicourt and Vernon, and on Aug. 24 liberated Paris. By Aug. 27 Allied forces were lining the Seine along almost its whole length and had crossed in strength at four places, the remnants of the German 7th army being hemmed in near Elbeuf. On Aug. 30, the British 2nd army swept forward from the line of the Seine nearly to the Somme, while the Canadian 1st army, after liberating Rouen, Aug. 29, struck N. to the Channel.

Seine. Dept. of France, formerly part of the prov. of Île de France. Entirely surrounded by the dept. of Seine-et-Oise, it consists of the twenty arrondissements of Paris, together with the surrounding dists. It is traversed by the Seine valley, the Marne joining the Seine within the dept. Intensive agriculture, market gardening, etc., are important. Its administration is closely connected with that of Paris. Its area is 185 sq. m. Pop. 4,775,711.

Seine-et-Marne. Dept. of France, formerly part of the prov. of Île de France. It lies contiguous with the depts. of Seine-et-Oise, Oise, Aisne, Marne, Aube, Yonne, and Loiret, and is traversed by the Seine in the S. and the Marne to the N., other rivers including the Yonne, Loing, Yèze, Aubetin, Grand-Morin, Petit-Morin, and Oureq; the three last named were strategically of great importance in the battle of the Marne, 1914. Mainly agricultural, the dept. produces grain, beet, and vines, and dairy farming, with many famous brands of cheese, is important. Industries include preserving food-stuffs, sugar refining, distilling, brewing, tanning, and paper, printing, brick, and tile works. Melun is the capital, other towns being Coulommiers, Fontainebleau,

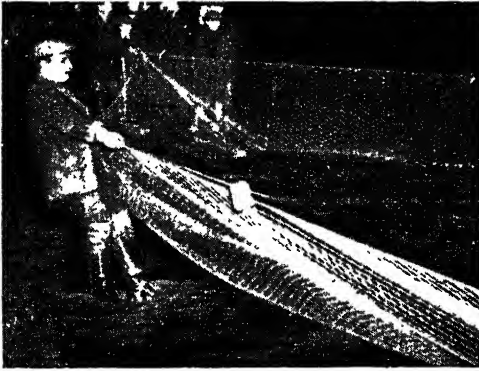
Provins, Mortant, and Monttereau. Its area is 2,275 sq. m. Pop. 407,137.

Seine-et-Oise.

Dept. of France, formerly part of the prov. of Île de France. It lies adjacent to the depts. of Seine-et-Marne, Loiret, Eure-et-Loire, Eure, and Oise, and surrounds the enclave of the dept. of Seine. It consists of three main plateaux, those of Beauce, Brie, and Vexin, with tracts of hilly country between. The dept. includes the valley of the Seine from near Corbeil to a point near Vernon, and tributaries of the Seine within it are the Oise, Essonne, Marne, Yères, Juinne, Orge, Yvette, Bièvre, Avre, Maudre, etc. The Beauce and Brie are rich grain-growing tracts; beetroot growing and market-gardening are important. Porcelain, paper, and brewing are among the industries. The capital is Versailles, other towns including Pontoise, Mantes, Rambouillet, Étampes, and Corbeil. Its area is 2,184 sq. m. Pop. 1,414,910.

Seine-Inférieure. Dept. of France, formerly part of the prov. of Normandy. Bounded on the N. by the English Channel, it is adjacent to the depts. of Somme, Eure, and Oise. The chalky plateau of Caux forms a great part of its surface, and distinctive features of the country are the steep wooded valleys and high chalk cliffs of the coast. Rivers include the lower reaches of the Seine, and the Béthune, Varenne, Scie, and Epte. Forests include those of Eu, Bray, Hellet, Rouvray, and Roumare. Agricultural products include cereals, beet, and cider apples. There are fishing fleets at Le Tréport, Dieppe, Fécamp, etc., and industries centre on Rouen and Havre (*q.v.*). Among the many popular small watering-places on the coast are Le Tréport, Pourville, Varengeville, Fécamp, and Étretat. Rouen is the capital, other towns being Havre, Neufchâtel, and Yvetot. Its area is 2,448 sq. m. Pop. 846,131.

Seine Net (Fr. from Lat. *sagena*, Gr. *sagēnē*, drag-net). Fishing net kept outstretched by means of corks at the top, and leads at the bottom edge, and used to encircle fish, and draw them to the shore



Seine Net used in salmon-fishing on the Tweed

or into a boat. In sea fishing the seine net is used principally for the capture of herring, pilchards, sprats, mackerel, bass, or grey mullet. If caught in deep water, the fish are emptied from the net into boats. If caught in shallow water they are drawn on to the beach. Numerous legal restrictions govern the use of the seine net for salmon-fishing. Thus a seine net may not be used for more than one-third of the year, nor may it be worked right across a stream, or within a certain distance of another net of the same kind.

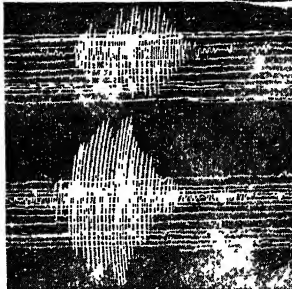
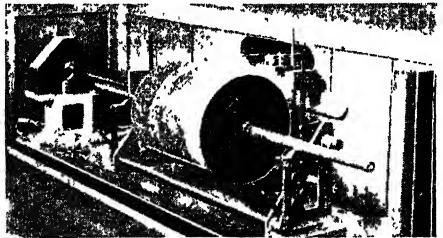
Seir. Name in the O.T. for the mountainous dists. of Edom (*q.v.*).

Seisin or **SEIZIN.** (Old Fr. *seisine* from *seisir*, to seize). Word of French origin, used in feudal times for taking possession of land. A man was seised of an estate when he took possession thereof. After a time it was applied to freehold land only, but it is now almost obsolete. Primer seisin was the name given to the right possessed by sovereigns of taking the revenue of an estate held by a tenant-in-chief for a

certain time, generally a year, whenever the holder thereof died. This custom was abolished in England in 1660. The Scottish equivalent of the word seisin is sasine. See Feudalism.

Seismograph (Gr. *seismos*, earthquake; *graphein*, to write). Instrument for recording automatically the tremors of the earth. It consists of a simple pendulum placed on a concrete pillar, embedded in the ground. The framework to which the pendulum is attached moves in sympathy with earth movements due to a distant earthquake, the bob of the pendulum tending to remain stationary. The sensitivity of such an arrangement, however, is low and modern seismographs are therefore fitted with special types of pendulums. An oscillatory system once disturbed will oscillate with its natural period, irrespective of the period of any vibrations superimposed upon it. Hence to obtain a record of the latter the free motion of the pendulum must be damped down, *e.g.* by mechanical or magnetic means. The degree of damping must not be so great as to render the pendulum sluggish, but generally it must be sufficient to suppress the free motion in the shortest possible time, that is, it must produce a "dead-beat" action.

Vibrations caused by distant earthquakes are small, and the relative motion between the inertia mass and its support must be



Seismograph. Top, revolving drum with the pens which record the earth tremors. Below, earthquake record, showing the amplitude of movement along two directions at right angles to each other

magnified. The pendulum of a mechanical seismograph is connected by a long arm or system of levers to a stylus, pressing lightly on a sheet of paper on which soot is deposited. This chart is wrapped round a clockwork or electrically driven cylindrical drum which makes one revolution in an hour; a traversing mechanism is embodied for economy of paper.

The daily record therefore takes the form of 24 equally-spaced lines running lengthwise along the sheet. Earth movements displace the stylus perpendicular to the direction of the undisturbed trace,

and provision is made for time-marking the record at minute intervals. The most popular seismograph which is based upon this principle is the Wiechert, where the mass of the pendulum varies from 80 to 200 kilograms; it affords a magnification of about 100 times.

Although there is the advantage of the trace being available for inspection at the time of occurrence, such entirely mechanical seismographs have been largely superseded by other types employing optical or electro-magnetic methods of registration by which friction is eliminated. In the direct optical pattern a beam of light is reflected from a small mirror, mounted on the pendulum, and focused as a sharply-defined spot on a sheet of photographic bromide paper. Examples are the well-known Milne-Shaw for general recording and the short period, high magnification (1,500 times) Wood-Anderson. In most horizontal seismographs gravity is the restoring force, but the Wood-Anderson type makes use of the torsional reaction of a stretched vertical wire carrying the bob, which weighs about 1 gm. Electro-magnetic seismographs depend upon the principle that the movement across a magnetic field of a coil of wire, mounted on the pendulum, sets up electric currents in the coils, the strength of current being proportional to the angular velocity of the pendulum. The coil is connected to a mirror galvanometer and the deflections of the mirror are recorded photographically (e.g. Galitzin pattern).

An earthquake causes a disturbance communicated to other parts of the earth in the form of waves, and, in general, any ground movement may be regarded as composed of the component displacements along three directions at right angles to each other, N-S, E-W, and vertical (Z) being adopted by convention. To investigate the origin and magnitude of earthquakes it is therefore necessary for the station to be equipped with seismographs capable of recording all three components. Vertical instruments are much more troublesome to maintain than horizontal ones for the reason that the coiled spring chiefly used to control the motion of the pendulum is very sensitive to temperature changes. To facilitate the interpretation of the traces, seismographs are constructed to record both horizontal components, and sometimes the vertical, too, side by side on the same sheet

of paper. In regions where violent shocks are frequently experienced less sensitive seismographs are employed. An important economic application of the seismograph is in prospecting for oilfields, etc., information on the nature of the subsoil being provided by seismic records of the ground waves from artificial explosions. See Earthquake; Pendulum

Seistan. Region of Afghanistan and Persia. Lying around the immense swamp called Lake Hamun, and anciently known as Sacastane, its boundaries are somewhat indefinite, but its area is put at about 7,000 sq. m., most of it belonging to Afghanistan, with its chief town, Nusretabad or Nasirabad, on the E. side of the lake. Though subject to inundations, much of the country is good agriculturally. The W. side of Lake Hamun is mountain-



Selaginella. Moss-like, flowerless plant, growing upon stones

ous, the E. side flat. During the summer months a strong N. wind, known as the "seistan," blows sometimes with gale force. The frontier between Persian and Afghan Seistan was delimited in 1872 by a commission appointed by the government of India at the request of the shah of Persia.

Sejanus, LUCIUS AELIUS (d. A.D. 31). Commander of the praetorian guard under the Roman emperor Tiberius. His influence with the emperor was very great, and he used his power in the most tyrannical manner. Ambitious of securing the imperial throne for himself, he persuaded Tiberius to retire to Capri, and set himself to put out of the way every member of the house of Germanicus that stood between him and the throne. Agrippina and her sons Nero and Drusus were banished. Tiberius at last began to suspect the designs of Sejanus, and through the agency of a trusted officer named Macro, whom he sent to Rome, the senate was encouraged to take action against the fallen favourite. His death was

decreed, and he was executed forthwith. The name of Sejanus is given to a tragedy by Ben Jonson, 1603.

Sekhet or **SEKHMET**. Egyptian goddess. Typifying, like Pakht of Beni Hasan, the destructive solar heat, she is represented as lioness-headed, with sun-disk and uraeus. She is the sister-wife of Ptah, and aided Ra in the mythical destruction of mankind. Of her many statues from Thebes, 30 are in the British Museum. See Bast; Egypt.

Sekondi or **SECONDEE**. Port of the Gold Coast Colony, Africa. Between Dixcove and Cape Coast Castle, it is the principal port of the colony, and is connected by rly. with Takoradi junction on the main line from Accra to Kumasi. Pop. 21,614.

Selachians. Name sometimes given to the sub-class of fishes also known as Elasmobranchs (*q.v.*).

Selaginella. Extensive genus of moss-like evergreen flowerless plants of the family Selaginellaceae. They are natives of all warm and temperate regions. The plants much resemble the club-mosses (*Lycopodium*), differing chiefly in the production of two forms of spores (macrospores and microspores) and spore-capsules. The macrospores are female, giving rise to prothallia, bearing archegonia, which are fertilised by the products of the microspores. The small leaves overlap and cover the stems. The best known species is *S. kraussiana*, a S. African species, commonly grown in greenhouses, which has trailing and rooting stems about a foot long.

Selaginellaceae. A family of flowerless plants of the class Pteridophyta. It includes the genera *Selaginella* and *Isoetes*. See Quillwort.

Selah. Term, probably of Hebrew origin, often used in the Psalms and occasionally in the book of Habakkuk. It is supposed to be a direction to readers or chanters to lift up their voices at the end of a strophe.

Selangor. One of the nine states of the Federation of Malaya. It lies between Perak and Negri Sembilan and between Pahang and the coast on the Strait of Malacca. From 1867, when the East India co. ceased to administer the Straits Settlements, continued piracy from Selangor troubled the British authorities, with the result that a British resident was appointed in 1874. The state is drained chiefly by the Klang river, on which is Kuala Lumpur, capital of the Federation of Malaya and,

since 1896, capital of Selangor, a Chinese town since 1872, and one of the greatest towns that have ever existed in Malaya. Tapioca plantations, tin-mining, and timber-cutting cleared away the jungle from this district, and, when these industries declined, rubber and coffee plantations took their place. Coffee planting ceased to be profitable, but rubber planting developed, especially along the Klang river to its mouth and at Kuala Langat.

The main western rly. of Malaya passes Kuala Kubu, Kuala Lumpur, Kajang, and many tin-mining towns; a branch goes N.W. from Kuang through the coalfield; the chief branch goes from Kuala Lumpur through Klang to Port Swettenham, the chief rubber port in Malaya. Excellent roads serve the exploited areas. Klang is the seat of the sultan. The area of Selangor is 3,160 sq. m. Pop. 701,552. See Malaya.

Selbie, WILLIAM BOOTHBY (1862-1944). A British divine. Born at Chesterfield, Dec. 24, 1862, he was educated at Manchester Grammar School and Brasenose College, Oxford. After lecturing on theology at Mansfield College, he was from 1890 until 1909 a Congregational minister at Highgate and Cambridge. He edited *The Examiner*, 1899-1909. Selbie was principal of Mansfield College, 1909-1932, and president of the Free Church Council, 1917. His chief book was *The Life and Teaching of Jesus Christ*. He died April 28, 1944.

Selborne. Village of Hants, England. It is 5 m. S.S.E. of Alton and 52 m. S.W. of London,

1232, and the place was once a market town. See White, Gilbert.

Selborne, ROUNDELL PALMER, 1ST EARL OF (1812-95). British lawyer. Born at Mixbury, Oxon,



1st Earl of Selborne, British lawyer

Nov. 27, 1812, he was educated at Rugby, Winchester, and Trinity College, Oxford, where he had a brilliant career, and was called to the bar at Lincoln's Inn, 1837. In 1847 he entered the house of commons, to remain, with short intervals, a Liberal M.P. until 1892, being solicitor-general, then attorney-general, in the Whig ministry of 1859-66. He was also a leader of the Chancery bar. In 1872 he was appointed lord chancellor and created a baron. He was responsible for the Judicature Act of 1873 which set up the English supreme and high courts in their present form and provided for the fusion of law and equity. Selborne left the woolsack in 1874 on the fall of the Liberal government and returned in 1880. Created an earl in 1882, he left office in 1885, and broke away from Gladstone in 1886 over the Home Rule question. To the end prominent as a churchman, he died May 4, 1895.

Selborne, WILLIAM WALDEGRAVE PALMER, 2ND EARL OF (1859-1942). British politician. Born Oct. 17, 1859, the son of the 1st earl, he was educated at Winchester and University College, Oxford. As Lord Wolmer, he

as high commissioner of S. Africa in 1905, and remained there while the details of the new federal constitution were worked out. In 1910 he returned home, and in 1915 joined the coalition government as president of the board of agriculture, resigning in 1916 owing to his disagreement with policy. He died Feb. 26, 1942.

He was succeeded in the title by his eldest son, Roundell Cecil Palmer (b. April 15, 1887), who as Viscount Wolmer became parl. secretary, board of trade, 1922-24, and was minister of Economic Warfare, 1942-45.

Selborne Society. Society originally formed in 1885 under the name of the Selborne League for the preservation of birds, plants, and pleasant places. In 1886 it was joined by the Plumage League, and carried on propaganda work against the wholesale destruction of wild birds for their plumage. The society also supports efforts to secure safe nesting-places for birds, especially in the neighbourhood of large towns, and generally to promote nature-study.

Named after Gilbert White, it met at Selborne in 1893 to celebrate the centenary of his death. The society organizes country and town rambles in connexion with antiquarian and historical study. Its offices are at The Hermitage, Hanwell, London, W.7.

Selby. Urban district and market town of Yorkshire (W.R.), England. It stands on the Ouse, 14 m. S. of York by rly. A canal connects it with the Aire and Calder navigation. The town is famous for its parish church, a magnificent cruciform building, restored after a fire in 1906. This belonged to a Benedictine abbey founded by William the Conqueror in 1069. It is 360 ft. long, and its features include some beautiful Norman and Decorated work, although the fire did irreparable damage. In 1690 the central



2nd Earl of Selborne, British politician



Selborne, Hampshire. Garden front of The Wakes, the home of Gilbert White, who lived in the older portion seen on the right

with a rly. station. The village is known as the birthplace of Gilbert White, author of *The Natural History of Selborne*. His house is shown, and he is buried in the churchyard. S. Mary's church dates back to Edward the Confessor's day, and has a fine 14th century window. An Augustinian priory was founded here in

entered parliament as Liberal M.P. for E. Hants in 1885, retaining the seat after he had become a Liberal Unionist. M.P. for W. Edinburgh, 1892-95, he succeeded to the earldom in the latter year, in which he was made under-secretary for the colonies. Having been first lord of the admiralty, 1900-03, Selborne succeeded Milner



Selby. Urban district arms

tower fell and destroyed the south transept, which was rebuilt in 1912. The town is the traditional birthplace of Henry I. Selby has boat building



Selby, Yorkshire. The Abbey church from the south-west

and oil works, and there is a considerable agricultural trade. The Ouse is navigable here for vessels of 200 tons. Market day, Mon. Pop. est. 10,000.

Selby, WILLIAM COURT GULLY, 1st Viscount (1835-1909). British politician. Born Aug. 29, 1835, the son of a doctor of medicine, he was educated at Trinity College, Cambridge. He became a barrister and in a quiet way enjoyed a good practice. In 1886, having hitherto failed



1st Viscount Selby,
British politician
Elliott & Fry

to secure election, he was chosen Liberal M.P. for Carlisle. In 1895 Gully was put forward by the Liberals as a candidate for the office of Speaker, and was elected. He held the post until 1905, when he was created Viscount Selby. He died Nov. 6, 1909. In 1923 the title passed to his grandson, Thomas Sutton Evelyn Gully (b. Feb. 16, 1911), who thus became 3rd viscount.

Selden, JOHN (1584-1654). English jurist and antiquary. Born at Salvington, near Worthing, Sussex, Dec. 16, 1584, he was educated at Chichester and at Hart Hall, afterwards Hertford College, Oxford. Settling in London, 1602, he became a student at Clifford's Inn, in 1612 was admitted to the bar at the Inner Temple, formed friendships with some of the most learned men of the time, Camden and Ben Jonson among the number, and



J. Selden
After Lely

keeper of records at the Tower. He signed the Solemn League and Covenant. A great scholar, whose legal writings are still quoted with authority, his *History of Tythes*, 1617, while admitting their legal, denied their divine, right, and was suppressed. His other works include *Titles of Honour*, 1614; *De Diis Syriis*, 1617, on the gods of Syria; and *Privileges of Baronage*, 1642; but he is best remembered for the volume usually called *Selden's Table Talk*, 1689, compiled by his amanuensis, Richard Milward. He died Nov. 30, 1654. A complete edition of his works, ed. D. Wilkins, was published in 1726. See Temple.

Selected Areas. In astronomy, regions of the sky subjected to fuller investigation than is possible for the whole heavens. In 1906 Kapteyn put forward a plan by which 206 such areas distributed uniformly over the sky should be exhaustively studied. Assuming that this represents a fair sample of the sky, the results can be regarded as typical of the whole universe.

Selection. Biological term used in several different senses, all having reference to the process of evolution or the production of types of individuals. Natural selection is a term often used to express the central idea of the Darwinian theory of evolution, according to which the individuals of a species least fit to survive are eliminated.

Artificial selection is the process which is used by breeders of animals in the endeavour to produce certain special types or qualities, as in horses and cattle, the progenitors of the race being picked out by man for reasons of his own. Germinal selection denotes the theoretical selection which possibly occurs amongst germ-cells in a vertebrate body.

appears to have been one of the company frequenting the Mermaid Tavern (*q.v.*). He sat in the Long Parliament for Oxford university, was a lay member of the Westminster Assembly (*q.v.*), and was several times in prison on account of his opinions. Among other offices he held that of

Reversed selection takes place when the selection affects not the increase of an organ but its decrease. Sexual selection is that part of the process of natural selection where sex comes into operation. The whole process of selection, whether natural or artificial, tends to the elimination of harmful or useless types or qualities and the improvement of species. See Biology; Darwinism; Natural Selection; Sex.

Selective Service. A system of military conscription adopted by the U.S.A. during each of the two Great Wars. The first Selective Service Act was signed by Wilson, May 18, 1917, and the second by F. D. Roosevelt, Sept. 16, 1940. The principle of the system was set forth as follows by the secretary of war in 1917: "It selects only those who by reason of their age and physical capacity are best fitted to receive the training and withstand the actual hardship of campaign, and who happily can be taken with least disturbance of normal economic and industrial conditions." According to these Acts, male citizens and alien residents within certain age limits were required to register on a specified date. Local civilian boards were appointed to administer the Acts with power, subject to appeal, to decide upon claims of exemption or deferment according to specific classifications of men available or non-available for military service. The order of calling-up was determined by means of a lottery at Washington. Thus on Oct. 29, 1940, H. L. Stimson, secretary of war, inaugurated the service by drawing, blind-folded, from a glass bowl, the number 158 as the first of the 16,313,240 cards of men registered.

Selēnē. In Greek mythology, goddess of the moon. She was the daughter of Hyperion and a sister of Helios, the sun-god, and Eōs, goddess of the dawn. She made her journey across the heavens in a chariot drawn by two white horses. Just as in later times Helios, the sun-god, became identified with Apollo, so Selēnē became identified with Apollo's sister Artemis. There was a legend that Selēnē became enamoured of the beautiful youth Endymion, and used to visit him nightly. *Prom. Selenece.*

Selenga or **SELENGA.** River of Mongolia and the Mongol-Buryat A.S.S.R. Rising in the Khangai Mts., it traverses Chinese territory, and, after uniting with the Orkhon, flows into Lake Baikal. Its length is about 750 m.

Selenite. Transparent crystalline variety of gypsum, commonly found in large crystals in clay formations. Twinned crystals possess a characteristic arrow-head form. *See* Gypsum.

Selenium. Chemical element, symbol Se; at. no. 34; at. wt. 78.96, discovered by Berzelius in 1817. Like sulphur it exists in several allotropic forms. Red selenium forms two different kinds of crystal known as α and β ; density 4.5 gm per c.c.; melting point (on rapid heating) about 180° C. An amorphous or vitreous red selenium can also be obtained by chemical means. If this is heated slowly to about 175° C. it changes to crystalline grey selenium A, which on standing changes again to the more stable B form. Crystalline grey selenium B is also obtained by slowly heating crystalline red selenium to about 200° C. It forms hexagonal crystals with metallic properties, density 4.8 gm per c.c., melting point 220° C. Liquid selenium has a density of 4.27 gm per c.c.; b. p., 684.8° C.

Selenium colours glass pink, and is used therefore to neutralise the green tint in glass produced by iron, and so to decolorise the glass. In larger quantities it produces red glass for signal lamps.

Crystalline grey selenium B exhibits the phenomenon known as photo-conductivity. In thin films, its electrical conductivity may be as much as ten times as great in strong light as it is in the dark, and it is particularly sensitive to the red end of the spectrum. Selenium cells are therefore used to operate burglar alarms, open doors, etc., by the interruption of infra-red beams; and to turn on and off marine and street lighting with the failure and return of daylight.

The term selenium cell is sometimes also applied to a photo-voltaic cell made of a thin film of iron selenide on iron, which gives a small current on illumination and is used in photographic exposure meters. *See* Photo-cell.

Seleucia. Ancient city of Asia. It was situated on the Tigris, on the frontiers of Assyria and Babylonia. Built by Seleucus I, king of Syria, between 312–302 B.C., it became a great and splendid city, reputed in the reign of the Roman emperor Titus to have 600,000 inhabitants; but eventually it was eclipsed by Ctesiphon as the chief city of W. Asia. After its capture by Severus, A.D. 198, its importance dwindled.

Seleucia Pieria. Ancient city of Syria. It was built by Seleucus I, king of Syria, in 300 B.C., and

was about 12 m. W. of Antioch, of which it was the port. Seleucia was a natural fortress, heavily reinforced. Prosperous and flourishing for many centuries, it eventually fell into decay, and was almost in ruins by the 6th century.

Seleucidae. Name of the Macedonian dynasty which ruled in Syria and other parts of W. Asia from 312 B.C. until the Roman annexation by Pompey in 65 B.C. Nearly all the monarchs of the dynasty bore the name either of Seleucus or of Antiochus. It was founded by Seleucus, called Nicator, or the conqueror, one of Alexander's generals, who in the partition of Alexander's empire acquired possession of Syria, Mesopotamia, and the regions east of the Euphrates.

Seleucus was succeeded by his son Antiochus I (280–262) called Soter, or the saviour, from his victory over the Gauls who invaded Asia Minor in 278. Seleucus II (246–226) was attacked by Ptolemy III of Egypt, who overran all Syria and Babylonia, and by Arsaces of Parthia, who wrested the countries beyond the Euphrates from him, while the king of Pergamum conquered most of Asia Minor. Antiochus III the Great (223–187) waged successful wars against Parthia and Bactria, but was unable to subjugate them effectively. On the other hand, he recovered the lost territories in Asia Minor and also Palestine.

Antiochus, the greatest of the eastern potentates, challenged the rising power of Rome, disastrously for himself. He met the Romans on European soil, but was defeated at Thermopylae, 191, and then still more decisively at Magnesia, in Asia Minor, 190. As a result of the treaty of 188, cessions of territory, indemnities, and other humiliating terms were imposed on him, which practically destroyed the prospect of further serious resistance to Rome on Syria's part. Antiochus died in 187 B.C. The ablest of his successors was his son Antiochus IV, called Epiphanes, 175–164. Attacked by Egypt, 170, he invaded and occupied that country, but in 168 was compelled by the Romans to withdraw. For another century after his death, c. 164 B.C., Antiochus followed Antiochus, varied by an occasional Seleucus or Demetrius, but none demands special notice except the last of the line, Antiochus XIII, who was finally deposed by Pompey in 65 B.C., when Syria was annexed as a province of the Roman republic. *See* Daniel; Syria.

Self-Consciousness. In philosophical language, a state of consciousness in which the idea of self or some aspect of self is present, the condition of being aware of oneself. It consists in introspective attention to some mental process which belongs to oneself and not to another, which forms part of one's own and no one else's experience. A person knows that he thinks and acts, and also that his thoughts and acts are his own.

The first idea of self, of its sphere and content, is to be looked for in the consideration of the human body, by which the consciousness of the existence of two distinct worlds, an external and an internal, first becomes possible. By reflection the nature of the body is established as external, and the Ego as an internal, mental substance. Practical factors in the formation of the idea of self are the marking off of our fellows by distinctive names, references to mind and minds, and more or less constant intercourse with others, all of which go to establish personal individuality. In popular language, self-consciousness is the idea that one is the subject of observation, good natured or ill-natured, by others. Undue anxiety as to what others think of one leads to inattention and neglect of one's occupation. According as one is agreeably or disagreeably affected, self-consciousness takes the form of vanity or shyness. *See* Introvert; Metaphysics; Psychology.

Self-Denying Ordinance. Law or order passed by the English parliament, April, 1645, requesting all members of parliament to resign their military and naval commands within forty days. The Civil War was raging, and the failure to crush Charles I at the second battle of Newbury brought the discontent of the parliamentarians to a head. Cromwell and Vane thought that Lord Essex, Manchester, and other leaders were not anxious to humiliate the king too much, and they decided upon the expedient of a self-denying ordinance. The first was thrown out by the lords, but they passed a second, and Cromwell was one of those who resigned. This second ordinance, however, unlike the first, allowed M.P.s to be reappointed, and Cromwell was soon chosen to command the cavalry. *See* Civil War.

Self-Determination. Term used in philosophy to describe a person's ability to determine his own course of conduct. During the First Great War it came to be applied in Allied propaganda to the

right to autonomy, claimed in 1918 for all peoples by Wilson in his Fourteen Points (*q.v.*) and subsequently elaborated in various speeches, the key phrase of which was, "What we seek is the reign of law, based upon the consent of the governed and sustained by the organized opinion of mankind." It was used in particular of the peoples who had formed the empire of Austria-Hungary. The peace treaties which concluded the First Great War sought to settle national boundaries in Europe in accordance with the principle of self-determination.

Self-Heal (*Prunella vulgaris*). Perennial herb of the family Labiatae. A native of Europe, N.



Self-Heal. Flower-heads and leaves

Africa, Asia, America, and Australia, it has a creeping root-stock, and short branching stems, with oblong or lance-shaped leaves. The purple, two-lipped flowers are produced in whorls, which are but slightly apart, the intervening bracts having purple margins. It was formerly used for wounds, and hence called carpenter's herb and sickle-wort.

Self-Help. Work by Dr. Samuel Smiles. Published in 1859, it was designed to show what can be accomplished by determination and the will to succeed, and is copiously illustrated by examples from the lives of men who attained eminence despite adverse circumstances. The book had an extraordinary success.

Self-Induction. In electricity, electrical inertia. It plays a similar part in an electrical system to a heavy fly-wheel in a mechanical one. The starting and stopping of an electric current occupies a small fraction of time. This is of little consequence with a direct current which flows continuously in one direction, but with an alternating current, where the direction is rapidly and constantly reversed, the effort of rapidly changing direction produces a counter electromotive force, which reduces the effective electro-motive force. See Current; Electricity.

Selfridge (HARRY) GORDON (1857-1947). An Anglo-American business man. Born of New Eng-

land stock at Ripon, Wis., U.S.A., in 1857, he left school at 14. After working as a clerk he entered the



Gordon Selfridge, Anglo-American business man
Russell

mail order business of Field, Lester, and co. in Chicago in 1879. Through his organizing ability and fund of ideas he advanced quickly, and in 1904 retired from a partnership in the Marshall Field co., with a fortune of £300,000. In 1909 he opened his store in Oxford Street, London, then one of the largest stores in Europe. Selfridge became a naturalised British subject in 1937. He wrote *The Romance of Commerce*, 1918. He died at the age of 90, May 8, 1947.

Self-Toning Paper. Formerly a popular photographic printing-out paper incorporating sufficient gold compound to tone the picture during fixation, thus eliminating the separate toning bath.

Selim I (1465-1521). Sultan of Turkey. Son of Bayazid II, he de-throned and killed his father, together with his brothers and nephews, in 1512, and two years later carried a war into Persia. Conquering Mesopotamia, Kurdistan, and Armenia, he led his triumphant army against the Mamelukes, whom he utterly defeated in 1516, annexing Egypt and wresting the title of caliph from the last of the Abbasides. Thus the sultan of Turkey became head of the Mahomedan world. Selim died Sept. 22, 1521.

Selim II (1524-74). Sultan of Turkey. Son of Sulciman the Magnificent, he ascended the throne in 1566, and though slothful and cowardly himself was fortunate in his grand vizier, Mahomed Sokkoli, who made advantageous treaties



Selim II, Sultan of Turkey

with the emperor Maximilian II and Ivan the Terrible, whilst his generals waged successful wars in the Hejaz and Cyprus, though the defeat of

Lepanto (*q.v.*) followed. Selim, whose habits had earned him the nickname of The Drunkard, died Dec. 12, 1574.

Selim III (1762-1807). Sultan of Turkey. Son of Mustafa III, he came to the throne in 1789, while his country was at war with Austria and Russia. Peace was concluded with these powers in 1791 and 1792 respectively, but in 1798 Napoleon's invasion of Egypt involved Turkey in a four years' war with France. Cultured and enlightened, Selim attempted to introduce reforms and raise Turkey to the western level of civilization, but the opposition, headed by the Janissaries, was too great, and riots broke out in Constantinople and Adrianople. In 1807 Selim abdicated in favour of his nephew Mustafa, who had him strangled.

Selincourt, ERNEST DE (1870-1943). English scholar and critic. Born Sept. 24, 1870, he was educated at Dulwich and University College, Oxford. An authority on the English romantic poets, he edited the standard editions of Wordsworth's poetry and letters and the introduction to his edition of Spencer was much praised.

During 1908-35 he Selincourt was professor of English at Birmingham university and vice-principal (1931-35). He was also professor of poetry at Oxford, 1928-33. His works include editions of Keats and Landor, Oxford Lectures on Poetry, and English Poets and the National Ideal. He died May 22, 1943. His brother, Hugh de Selincourt (b. 1878), was a critic and novelist. His works included *The Iligh Adventure*, 1908, Oxford from Within, 1910, *The Cricket Match*, 1924, and *Studies from Life*, 1934. Another brother, Basil, was a literary critic on *The Observer*.

Selinus. Ancient Greek city of Sicily. Situated on the S.W. coast, and originally a Dorian colony, it became one of the chief cities in Sicily. In 409 B.C. it was taken by the Carthaginians and almost destroyed, many of its inhabitants being sold into slavery. During the first Punic War it was again destroyed, and its inhabitants transferred to Lilybaeum.

Seljuks. Turkish family which ruled Western Asia in the 11th and 12th centuries. Its founder was



Selim III, Sultan of Turkey

Seljuk, who about A.D. 1000 led a band of Ghuz Turks from the N. to the region of Bokhara. His grandsons, after conquering Khorassan in 1039, gradually extended their sway over Persia, Toghrol (d. 1063) taking Bagdad, 1055, and becoming protector of the powerless Abbaside Caliphs. The Seljuks thus became the champions of Mahomedan orthodoxy, and prevented the disintegration of Islam at the hands of Persian sectaries. In the 11th century Syria and Asia Minor were conquered.

The Seljuk empire then extended from Kashgar to the Dardanelles, and from the Caucasus to S. Arabia. On Malik Shah's death the W. part broke up into independent states, of which the most illustrious was the Seljuk sultanate of Rum, the capital Iconium being the seat of a brilliant civilization, which lasted until the rise of the Ottoman Turks, about 1300. The W. Seljuks struggled against the first two Crusades, but were driven from Syria by Saladin (q.v.). The main line reigned at Hamadan until 1194. See Persia; Turkey.

Selkirk. Royal and mun. burgh of Selkirkshire, Scotland, also the county town. It stands on Ettrick

Selkirk, THOMAS DOUGLAS, 5TH EARL OF (1771-1820). British philanthropist. Born at St. Mary's Isle, Kirkcudbrightshire, June 20, 1771, youngest son of the 4th earl, he was educated at Edinburgh university, where he became a close friend of

Walter Scott, and succeeded to the earldom, 1799. He took keen interest in the economic condition of the Highlands of Scotland, and personally established settlements of Scottish emigrants in America. One, on Prince Edward's Island, founded 1803, was extremely prosperous. Other parties sent to the Red River Valley, now Manitoba, in the Hudson's Bay company's territories, met with many vicissitudes. He died at Pau, April 8, 1820. See Red River Settlement.

Selkirk, ALEXANDER (1676-1721). British sailor. The son of a shoemaker of Largo, Fifeshire, he had some experience of the sea during a turbulent young marhood, and in 1703 joined Dampier's expedition to the South Seas as navigator of the vessel Cinque Ports. In 1704, when off Juan Fernandez, he asked to be set ashore in consequence of a quarrel with his captain. He remained on the island 52 months, was then picked up by Captain Woodes Rogers, and eventually became mate of H.M.S. Weymouth, on which vessel he died. Rogers's Cruising Voyage Round the World, 1712, may have given to Defoe the idea of Robinson Crusoe (q.v.), and Selkirk's life suggested the well-known poem by Cowper.

Selkirk Mts. Mountain range in the S.E. of British Columbia. It extends N. from the U.S.A. boundary to the great loop of the Columbia river, and is a range of Alpine altitude, with magnificent forests and glaciers. Sir Donald (10,800 ft.), Dawson (11,100 ft.), and Bonney (10,200 ft.) are the highest peaks of the range. The

main pass is Roger's pass, crossed by the C.P.R. between Golden and Revelstoke.

Selkirkshire. Inland county of Scotland. In the south-east of the country, its area is 267 sq. m. The surface generally presents a succession of hills, the whole forming part of the forest of Ettrick. The highest points are Broad Law (2,754 ft.), Locheraig Head (2,625 ft.), and Dun Rig (2,432 ft.). The Tweed crosses the county; other rivers are its tributaries, Ettrick and Yarrow. St. Mary's Loch is the chief of several small lakes. Ettrickdale and the vales of the Tweed and the Yarrow, often visited by Wordsworth, are noted for their beauty. The chief industry is the rearing of sheep. Selkirk is the county town, but



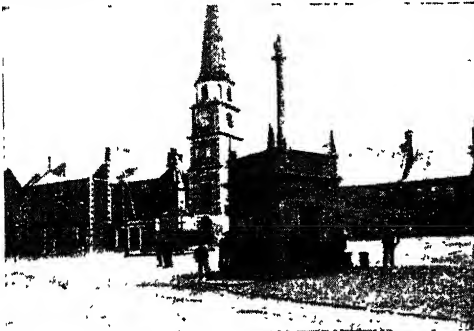
Selkirkshire arms

Galashiels is the most populous. The county unites with Roxburghshire to send a member to parliament. Selkirkshire has some British and Roman remains, and at Torwoodlee is a round tower. Its history is that of the borders, of which Ettrick Forest once formed one of the wildest parts. Pop. 22,100.

LITERARY ASSOCIATIONS. As a border county and the home of the Scott clan, Selkirkshire has a great ballad literature. James Hogg was born at Ettrick, and William Laidlaw at Blackhouse. At Foulshiels Mungo Park was born;



Alexander Selkirk. Statue of Robinson Crusoe at Largo, Fifeshire



Selkirk, Scotland. Mercat Cross and Town Hall, in front of which is a statue of Sir Walter Scott

Water, 40 m. by rly. S.W. of Edinburgh. The chief buildings are the town hall, free library, and grammar school. The town was long famous for its manufacture of shoes, an industry now superseded by that of woollen goods. Selkirk figured considerably in border warfare between Scotland and England. Market day, Wed. Pop. 5,667.

Selkirk. Town of Manitoba, Canada, 22 m. W. of Winnipeg, on the Red River. Served by the C.P.R., it is at the head of Lake Winnipeg navigation, and centre of its fishing industry (7,000,000 lb.). Other industries include a steel foundry, rolling mills, and lumbering. Pop. 5,408.



Selkirkshire. Map of the lowland county of Scotland

there is a statue of him in the town of Selkirk.

The county is second only to Roxburghshire in its association with Sir Walter Scott and his work. At Ashiesteel he lived for seven years, and there wrote *Marmion*, *The Lady of the Lake*, and *The Lay of the Last Minstrel*. In the last of these is described Deloraine, on the Ettrick, and Newark Castle. Consult *History of Selkirkshire*, T. Craig Brown, 1886; *Border Raids and Reivers*, R. Borland, 1910; *Highways and Byways in the Border*, A. and J. Lang, 1913.

Selle. River of France. Rising S. of Le Cateau, it flows in a N. direction, joining the Schelde at Denain. It figured prominently in the closing stages of the First Great War, when the British 4th army and 1st French army, together with specially equipped tanks, attacked the German 2nd and 18th armies holding positions on the river, on Oct. 17, 1918. They captured Le Cateau, crossed the Selle, and pushed patrols to the little river Harpies farther E. In no Allied victory of the war were such large captures of guns made; 475 were taken, in addition to 20,000 prisoners. See *Le Cateau*.

Sellenger's Round. Tune and dance, probably in connexion with Maypole festivities, that became enormously popular in England during the 16th and 17th centuries. The composer is unknown. There are many variants of the tune. See *Folk Song*.

Selly Oak. Suburb of Birmingham. It lies to the S.W. of the city proper, with a rly. station. It is largely a manufacturing area. The chief church is S. Mary's.

is a principal product. Selma was founded 1817, incorporated 1820, and chartered 1852. Pop. 19,834.

Selous, FREDERICK COURTENAY (1851-1917). British traveller and hunter. Born in London, Dec. 31,



F. C. Selous, British traveller Swaine

1851, he was educated at Rugby and in Germany. From 1872 to 1890 he explored and hunted in Matabeleland and the country between the Transvaal and the Congo, becoming friendly with Lobengula, who granted him many privileges. Afterwards Selous acted as guide to the British South Africa co. in an expedition to Mashonaland. He fought in the Matabele war of 1893, when he was wounded, and took part in quelling the Matabele rising in 1896.

On the outbreak of the First Great War Selous joined the forces in East Africa. He received his captaincy the following August, and was awarded the D.S.O. in Sept., 1916. He was killed in E. Africa, Jan. 4, 1917. His publications included *A Hunter's Wanderings in Africa*, 1881; *Sport and Travel*, East and West, 1900; *Recent Hunting Trips in British North America*, 1907; and *African Nature Notes and Reminiscences*, 1908. Selous was the original of Rider Haggard's hero Allan Quatermain. Consult *Life*, J. G. Millais, 1918. *Pron.* Seloo.

Selsdon, WILLIAM MITCHELL-THOMPSON, 1st BARON (1877-

Selma. City of Alabama, U.S.A., the co. seat of Dallas co. It stands on the Alabama river, 51 m. W. of Montgomery, and is served by the Southern and other rlys. It has a university for coloured students. With the decline of the cotton market early in the 20th century, the Selma region turned to diversified agriculture, especially stock and dairy farming. Cotton-seed oil

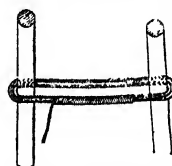
1938). British politician. Born at Edinburgh in April, 1877, he was educated at Winchester, and Balliol, Oxford. After some years in legal practice, he was Conservative M.P. for N.W. Lanark, 1906-10, for N. Down, 1910-18, and for Maryhill, 1918-22. During 1923-32 he was returned for S. Croydon. Occupying various junior government posts during 1919-22, he was postmaster-general 1924-29. Having been knighted in 1918, Sir William was raised to the peerage as Baron Selsdon in 1932. On Dec. 24, 1938, he died, and was succeeded by his son, Patrick (b. May 28, 1913).

Selsey or SELSEA. Watering-place of Sussex, England. It is 8 m. S. of Chichester, with which it was once connected by light rly. Here, in the 7th cent., S. Wilfrid founded a monastery and Selsey became the seat of the bishop of the South Saxons. In 1075 the see was removed to Chichester. The site of the cathedral and part of the old town were submerged by the sea. Fishing is the chief occupation, and in the 19th century it began to attract visitors. At the end of the peninsula is the headland Selsey Bill. The name means seals' island. Pop. cst. 2,500.

Selston. Village of Notts, England. It is 9 m. by rly. from Mansfield. In the neighbourhood are coal mines and ironworks. S. Helen's church is mainly Early English, S. Michael's is modern. Pop. 9,000.

Seltzer Water. Mineral water originally obtained from Selters, near Limburg, in Nassau, Germany, and strictly speaking the water should be called Selters water. Most of the so-called seltzer waters now obtainable in Great Britain and America are artificial preparations with a similar composition to that of the natural water. The latter is a highly aerated alkaline water containing bicarbonates of sodium, calcium, magnesium, sulphate of potassium, etc. It is helpful in cases of chronic indigestion and respiratory disorders.

Selvagee. Coil formed by winding rope yarn. The yarn may be wound round two posts spaced a certain distance apart, and a uniform tension should be applied. After winding, the coil is tightly bound together



Selvagee. Diagram illustrating how a selvagee is made

continuously by another length of yarn before removal from the posts. The strength of the selvagee depends upon the number of turns in the coil. Selvagees are used as temporary or improvised slings, and for other purposes in connexion with hoisting apparatus, especially in military engineering.

Selvas (Sp., forests). Almost impenetrable equatorial forests in the basin of the Amazon river. The selvas contain giant trees, below which there is an undergrowth of trees of ordinary forest dimensions, while the whole is interlaced with creepers. The trees which give rubber are of great economic value, and the selvas also contain vast wealth in valuable hardwoods and dyewoods as mahogany, ebony, sandalwood, logwood, etc. The name has been extended to other regions where similar climatic conditions produce similar forests. The chief of these are the Guinea Coast and the Congo Basin in Africa, and the E. Indies.

Selwyn, GEORGE AUGUSTUS (1719-91). British wit. He was born Aug. 11. 1719, and educated



George Selwyn,
British wit
After Reynolds

at Eton and Hertford College (then Hart Hall), Oxford, which he was compelled to leave in 1745, owing to a freak which was described as blasphemous. Before this event he had been appointed to sinecures which rendered him independent, and had made the grand tour. He became M.P. for the pocket borough of Ludgershall in 1747; succeeded his father in the family estate of Matson in 1751, and was member for Gloucester, 1754-80. Selwyn was chiefly known as a convivial man about town, possessed of a lively wit, and as the hero of numerous anecdotes. He died in London, Jan. 25, 1791.

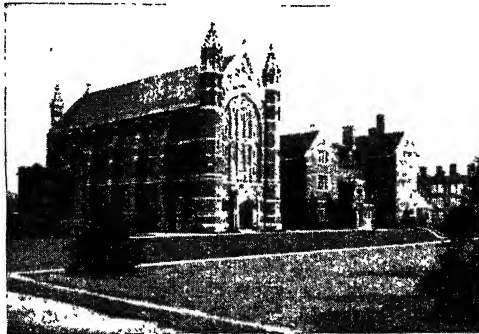
Selwyn, GEORGE AUGUSTUS (1809-78). British divine. Born at Hampstead, April 5, 1809, he was educated at Eton and St. John's College, Cambridge, where he won distinction as an oarsman and a scholar. In 1833 he was ordained, and in 1841 went to New



G. A. Selwyn,
British divine
After Richmond

Zealand as a missionary bishop, doing good work in developing the church in the young colony, where he was during the Maori War. Returning to England in 1867, he was consecrated bishop of Lichfield in 1868, and he was there when he died, April 11, 1878. Selwyn College, Cambridge, perpetuates his memory. *Consult* Lives, H. W. Tucker, 1879; G. H. Curteis, 1889.

Selwyn's son, John Richardson Selwyn (1844-98), was bishop of Melanesia, 1877-89, and master of Selwyn College, 1890-98.



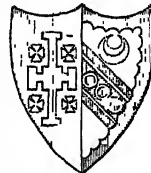
Selwyn College, Cambridge. Chapel and master's lodge

Selwyn College. One of the colleges of Cambridge university. Founded in memory of George

Augustus Selwyn, bishop of New Zealand, it was incorporated by royal charter in 1882, and is an approved foundation of the university. The chapel was consecrated 1895; the hall built in 1908-09, and the library in 1929. The society consists of the master, 11 fellows, and 12 scholars.

Selymbria or **SELIVRIA**. Ancient Greek city of Thrace. Situated on the N. coast of the Sea of Marmara, 37 m. W. of Istanbul, it was founded about 670 B.C. by colonists from Megara. The modern Silivri is a small town of European Turkey.

Selznick, DAVID OLIVER (b. 1902). American film producer, born at Pittsburgh, May 10, 1902. In 1936 he was awarded the League of Nations medal, and in 1939 received the Thalberg memorial award for the most consistent high level of film production. He won academy awards for *Gone With the Wind*, 1939, and *Rebecca*, 1940. Other Selznick films were *The Four Feathers*; *King Kong*; *David Copperfield*; *A Star is Born*; *Duel in the Sun*.



Selwyn College arms

Semang. Primitive people in the Malay peninsula, mostly in Patani, Kedah, central Perak, and N. Pahang. On the E. coast they are called Pangan. They use bows, wear sackcloth or leaf girdles, and inhabit rock-shelters or palm-leaf structures. Each tribe is ruled by a chief medicine-man.

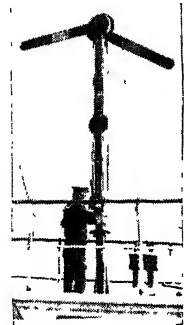
Semantics (Gr. *sēma*, sign). Study of the meaning of words, with the aims especially of giving a more exact significance to general terms and of making language a more precise instrument

of communication. The term was invented by Michel Bréal, French philologist. The study involves the application of philology, etymology, logic, and psychology to discover the true meaning of a word, and to remove prejudices and misunderstandings that interfere with the

communication of ideas. Semantists strive to give to such terms as "liberty," "individualism," "truth," the exactitude and freedom from misinterpretation of simple labels like "foot," "dog," "pencil." Basic English was an outcome of the semantic studies of C. K. Ogden. *Consult* Science and Sanity, A. Korzybski, 1933; *The Meaning of Meaning*, C. K. Ogden and I. A. Richards, rev. ed. 1936; *Tyranny of Words*, S. Chase, 1937.

Semaphore (Gr. *sēma*, sign; *phora*, a carrying). Instrument used for visual signalling, chiefly between ships at sea, and from ship to shore or vice versa. For use on

land it necessitated a series of stations built on eminences and having movable disks or shutters mounted in a frame and operated by cords and pulleys. It was invented in England in 1767, and put to practical use in 1794 to maintain contact between Paris and the French frontiers. In 1795 Lord George Murray



Semaphore on
British warship

introduced the semaphore into Great Britain to maintain communication between the Admiralty and Portsmouth dockyard. Instruments were placed on church towers, hills, etc., at an average distance of 8 m. apart, each station having in view the one in

Semarang. Town of central Java, capital of the former residency of the same name. It is situated 250 m E.S.E. of Jakarta, on the N. coast, at the mouth of the Semarang river, and has rly. connexion with Surabaya and Surakarta. It is an important commercial centre,

courses roughly N.W.; the Devoli turns S. and joins the Osum to form the Semen, which enters the Adriatic Sea.

Semeru. Volcano in E. Java. It rises to a height of over 12,000 ft., and is the culminating point of the island. It erupted violently in 1895.

Semibreve. Musical note written thus ♩ . It is the note of greatest value now used, and as such is the basis of the whole time system, including time signatures; but, as its name (nota semibrevis, the half-short note) imports, it was at first of little value, only the minim (*q.v.*) being of less.

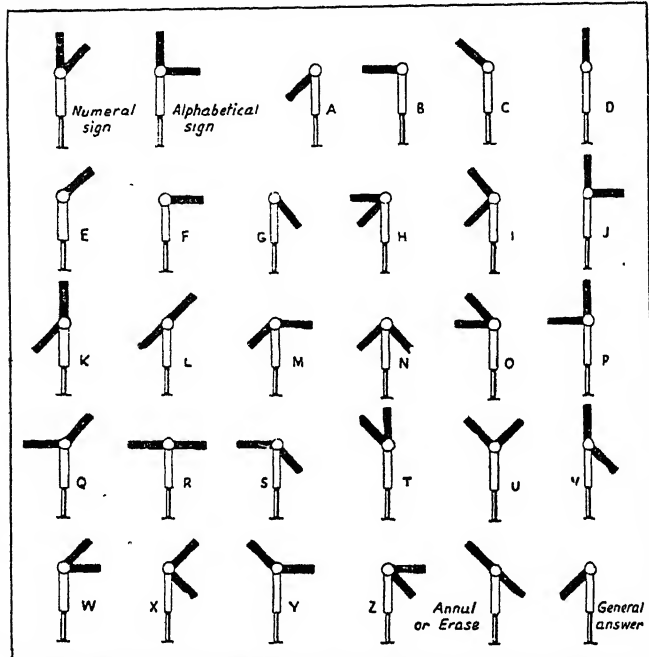
Semicolon. Punctuation mark (;) in printing and writing. It is used to indicate a pause longer than that shown by a comma, and shorter than that by a full stop. Many literary stylists consider its use a sign of weakness, as indicating an indeterminate compromise. See Punctuation.

Seminole. (Creek, seceder). North American Indian tribe of Muskogian stock. An offshoot of the Creeks (see Muskogees), after the extinction of the Apalachees in 1704, they seceded in order to settle in Florida, using pile-dwellings in the shallows. The Seminole War, 1835-42, cost them their homes, and, removing to Oklahoma as one of the Five Civilized Tribes, their separate nationhood ceased in 1906. They number some 3,000; in Florida, 250. See American Indians.

Semipalatinsk. Town of Kazakh S.S.R., capital of the region of the same name. It stands on the river Irtysh, 600 m. S.W. of Omsk, and was formerly a small agricultural centre. Under the Five Year plans, however, it developed rapidly, and important flour mills and meat-packing plants were built. It is on the Turksib rly. Pop. 109,779.

Semiquaver. In music, a small note, equal in time value to half a quaver (*q.v.*). In form it is similar to a quaver, with two black strokes on the stem ♪ .

Semiramis. Fabulous queen and co-founder of the ancient Assyrian empire which centred in Nineveh. Daughter of a Syrian youth and the Syrian fish-goddess, Derceto, she married Onnes, one of the generals of Ninus, and, having heroically taken part in the siege of Bactra, won the king's attention. Her husband then destroyed himself, and Semiramis married Ninus, whom she succeeded. She ruled for forty-two years, conquering many nations



Semaphore. The semaphore alphabet; when preceded by numeral sign, the letters A to I represent the figures 1 to 9

front and the one behind. A short message could be transmitted over the 72 m. between London and Portsmouth and an answer received in 15 mins. In 1816 Popham replaced the framework and shutters by an upright post with two arms which could be swung into different positions. With the coming of the electric telegraph, land semaphores were superseded, but the post-and-arm type continued to be used at sea. Telegraph Hill, near Guildford, received its name from the installation on it of the old Admiralty device.

Semaphore flag signalling is by the waving of two flags to make signals corresponding to those transmitted by semaphore arms. The flags are half blue, half white, and two feet square. With a single flag messages can be transmitted in Morse (*q.v.*). See Signalling.

Semaphore. Watering-place in S. Australia. On the Gulf of St. Vincent, it is a suburb of Adelaide, the capital.

and has shipyards. The town was originally connected with the sea by the river; later, a canal was made, and both river and canal require continual dredging. Petroleum and copper are found in the neighbourhood. The temporary surrender of Java in 1811 to the British was made here. Pop. est. 100,000.

Semele. In Greek mythology, daughter of Cadmus, king of Thebes, beloved by Zeus. Hera, prompted by jealousy, persuaded her to ask of Zeus that he should appear before her in all his glory. Zeus unwillingly consented, and in the lightning, which was the symbol of his majesty, Semele was consumed, after giving birth to a son by Zeus, the god Bacchus or Dionysus. Semele is the name of a secular oratorio by Handel, containing the tenor aria, Where'er you walk. See Bacchus. Pron. Semeele.

Semeni. River of Albania. The Osum and Devoli rise in the eastern mts. and flow at first in parallel

and founding Babylon, and then resigned the crown to her son, and disappeared to heaven in the form of a dove. Her memory is generally associated with opulent luxury and voluptuousness, and she is probably identical with the Syrian Venus Astarte. *See Assyria. Pron. Se-mirramis.*

Semite. Name denoting a group of peoples, past and present, mostly in W. Asia and E. Africa. Based on the fact that some of them are described in Gen. 10 as descendants of Shem, the name is applied primarily to peoples speaking closely related languages of the Semitic family.

The cradleland of the main Semitic-speaking peoples is not yet determined. Some characteristics of their speech and early culture bear such fundamental relationships to those of the Hamitic peoples, that a prehistoric period is assumed when Hamite and Semite were an undivided African or Afro-Asian branch of the white race. The typical Semite is essentially long-headed, tawny white, of medium stature, with black curly hair, strong beard, fine oval face, and straight or aquiline nose. The Jewish people, who are of mixed descent, and not typical Semites, acquired a distinctive form of nose, apparently by contact with an Alpine stock from Asia Minor.

The classification of these peoples, linguistic rather than racial, is broadly into N. and S. The S. Semites include the Arabians, both the pastoral nomads or Beduins of N. Arabia and the settled communities in the S. known in history as Minaean, Sabaeen, and Himyar, with their migrant offshoots in Abyssinia. The N. Semites penetrated to outlying regions in successive waves of migration under the pressure of the food quest when desert supplies failed. Archaeology and written history record their early appearance in ancient Mesopotamia, where they mingled with the riverside dwellers and founded Semitic dynasties in Babylonia and Assyria. Another wave, apparently later, accounts for the Aramaeans of the upper rivers, who may have given rise later still to the Canaanite peoples. These in their turn absorbed the Hebrew influx after its long contact with Egyptian civilization. The Phoenicians may be a part of the Aramaean stream which moved across from the Persian Gulf, mingling with and dominating the seafaring population of the E. Mediterranean.

The place of the Semite in human culture varies as much as his habitat. The desert-loving Beduin is to be distinguished from the Punic mariner, the agricultural Jew of E. Europe from the slave-trading Arab of equatorial Africa. None of man's primary inventions in technology and the useful arts is attributable to him. In his own environment, such art as the Semite practises is imitative rather than creative.

Semitic languages differ profoundly from Indo-European in vocabulary and grammatical structure. A dominant feature is the formation of roots containing three consonants, words being derived from them by vowel-changes, prefixes, and suffixes. Thus from the Arabic root *kṭp* are formed *kātib* *kataba* *kitāb*, a writer wrote a book. The verbal tenses denote completed or uncompleted action, and are formed by suffixes and prefixes respectively. There is no construction of compound words, such as bookbinding, bookishness. The only Semitic dialect spoken exclusively by Christians is Maltese.

The service rendered by the Semite to the intellectual life of mankind by sharing in the formation and dissemination of alphabetic writing was very great. Apart from religious poetry and idealism, where it reigns supreme, Semitic literature is of secondary rank. *See Anti-Semitism; Jews.*

Semitone. Smallest interval recognized in European music. It may be described as the distance on the pianoforte from any given note to its immediate neighbour, and thus it will always be represented by two notes of different colours, except when between E and F, and B and C. Semitones are of two kinds: diatonic, having different letter names, and chromatic, having the same letter name for the two notes, *e.g.*

The chromatic semitone is smaller than the diatonic; in other words, D flat is sharper than C sharp, but equal temperament (*q.v.*) having divided the octave into twelve mean semitones, the difference between the two has become one merely of grammatical writing. String players commonly display a tendency to accentuate the sharpness of the sharp and the flatness of the flat, thereby making their chromatic semitone larger than their diatonic.

Senliki. River of Central Africa. It flows N.E. from the Edward Nyanza to the Albert



Semmering, Austria. Entrance to the railway tunnel through the Eastern Alpine mountain pass

Nyanza, partly through Belgian and partly through British territory. It runs W. of the mountain mass of which Ruwenzori is the principal peak, and forms one of the headwaters of the Nile. Except when closed on account of sleeping sickness, it is navigated in canoes. Length 150 m.

Semmering. Pass in the Eastern Alps, Austria. It is 3,300 ft. above sea level and extends for 33 m. by rly. from Gloggnitz in Lower Austria to Mürzzuschlag in Styria. It is on the historic route to Vienna from the S.W., and was opened as a bridge path in the 13th century. A road was completed in 1728. The rly., opened in 1854, avoids the summit by a tunnel a mile long and 282 ft. below the pass. Within the pass are 15 tunnels and 16 viaducts.

Semneh. Ruined fortress in the Sudan. On the left bank of the Nile, 37 m. S. of Halfa, it was founded, with Kummeh, on the right bank, to guard the new S. frontier of Egypt, by Senusert III who set up a remarkable inscription there urging resistance to Nubian attacks, and built a temple in the fortress, rededicated by Thothmes III to Khnum and the Nubian god Didun (Tithōnus). It is the ancient Samnin or Sammina. *See Egypt.*

Semnones. Ancient German tribe. In the 1st century A.D. they inhabited the region E. of the Elbe between that river and the Oder and Havel. They claimed to be the leading tribe of the Suevic confederation, whose religious centre was in their territory. Having submitted to Maroboduus, king of the Marcomanni (*q.v.*), they revolted with their northern neighbours the Langobardi, and helped Arminius to defeat him, about A.D. 18.

Semolina (It. *semolino*, grits). Middlings or coarse particles of the grain produced during the process of grinding wheat. Semolina is largely used in the manufacture of macaroni and is a principal ingredient of many well-known cereal foods, in addition to forming the base of nutritious puddings.

Sempach. Town of Switzerland, in the canton of Lucerne. It stands on the E. shore of Lake Lucerne, 1½ m. by road from its station, 9 m. by rly. from Lucerne. Pop. est. 1,500.

The battle of Sempach was fought July 9, 1386, between the troops of Leopold, duke of Austria, and the Swiss. For an act of defiance Leopold decided to punish the inhabitants of Sempach. The men of Lucerne called those of other cantons to their aid, and outside Sempach 1,500 of them met the Austrians. The nature of the country compelled the knights of the latter to dismount, and a stubborn fight ensued. At length the Swiss attacks prevailed, and soon their victory was complete, Leopold and many of his men being killed. It was in this battle that Arnold von Winkelried (*q.v.*) is said to have performed his feat of breaking the hostile line by drawing to his breast a group of spears.

Sempervivum. Perennial succulent herb, a familiar example being generally known under its English name of house-leek (*q.v.*).

Sempill, BARON. Scottish title held by the family of Sempill since about 1489. The founder of the family, Sir John, was killed at Flodden, 1513. The succession passed through his son William (d. 1550) to Robert, 4th baron, who was Scottish ambassador to Spain in 1596. From him the title descended to Francis, 8th baron, on whose death without issue in 1684 the title passed to his sister Anne, wife of Robert Abercromby. Their eldest son, Francis, became 10th baron in 1695. From Hugh, the 12th baron, the title descended to Selkirk, 15th baron, on whose death in 1835 it fell to his sister, Maria Janet. On her death in 1884 the title passed to Sir William Forbes, grandson of the 12th baron's daughter, Sarah. He was the 17th baron and was succeeded in 1905 by his son, John Forbes-Sempill, as 18th baron, and in 1934 William Francis Forbes-Sempill (b. Sept. 24, 1893), who was well-known as an airman, became the 19th baron. Lord Sempill's heir is known as the Master of Sempill.

Sempronia. Name of a Roman plebeian gens or clan, the most

distinguished family of which was that of the Gracchi. Sempronia was the name of the sister of the Gracchi and the wife of Scipio Aemilianus. She was suspected, but without reason, of having poisoned her husband. Sempronia is the name of a learned woman in Ben Jonson's drama *Catiline*.

Sen. Japanese bronze coin, the one-hundredth part of a yen (*q.v.*). Its nominal value is one farthing.



Sen. Both faces of the Japanese bronze coin. The actual diameter is 1½ ins.

Sena. Township and dist. in Mozambique. The town is on the Zambezi, where the rly. from Beira to Lake Nyasa crosses it, and was once an important centre of trade. The dist., which contains many cattle, extends inland S. of the Zambezi from its mouth to the district of Tete.

Senanayake, DON STEPHEN (b. 1884). First prime minister of the dominion of Ceylon. See N.V.

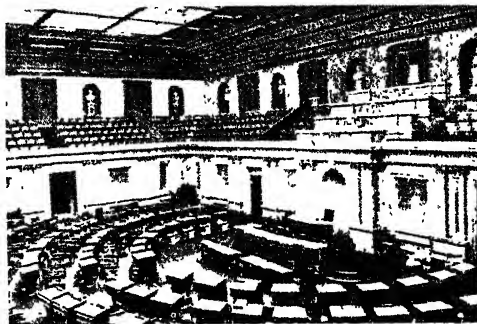
Sénancour, ÉTIENNE PIVERT DE (1770–1846). French author. Born in Paris, he studied philosophy,



Étienne de Sénancour, French author

and ran away to Switzerland to escape the training for the Church intended by his father. Returning to Paris about 1800, he lived in obscurity and wrote a number of works, of which the best known is the sentimental, introspective romance *Obermann*, 1804, familiar to English readers through the two elegiac poems of Matthew Arnold, who praised its "austere sincerity" and "delicate feeling for nature." Sénancour died Jan. 10, 1846.

Senate (Lat. *senatus*, council of elders). In ancient Rome, originally a council of *patres* or



Senate. Second Chamber of the U.S.A. legislature. It is in the Capitol at Washington

heads-of clans or families, chosen by the king, and meeting to advise upon public matters. With the establishment of a republic the senate became the most powerful factor in the new constitution under which Rome was developed from a city state into a world empire. There were two classes of senators, those nominated by the consuls or at a later date by the censors to fill vacancies, and, after 351 B.C., certain ex-magistrates who sat in virtue of having held office. The censor had also the power to deprive unworthy members of their seats. Whether plebeians were admitted to the senate in early times is uncertain, but the patricians long reserved the dignity for themselves, until the disabilities of the plebeians were removed. The number of senators varied from 300 in the early times to 1,000 in the time of Julius Caesar. Augustus fixed the number at 600.

Notwithstanding its theoretical limitations, the senate had large administrative and legislative powers. The former included the care of the national religion, public morals, the control of public finance, the conduct of war (apart from actual operations in the field), negotiations with foreign powers, and the government of the provinces. In the legislative sphere it originally confirmed or annulled the laws voted by the comitia or popular assembly, but in course of time its approval came to be given or withheld before the measure was introduced to the comitia. In times of emergency the senate had the power to confer special authority on magistrates, to suspend certain laws, to call citizens to arms, and to take other measures.

Under the empire the senate became definitely a law-making body, and was also the supreme judicial authority. It elected the magistrates, but only from among

candidates chosen by the emperor. In theory, at least, it conferred the imperial dignity on the emperor. With the growth of absolutism the power and importance of the senate gradually diminished, until by the time of Diocletian and Constantine it became merely the municipal council of the city of Rome.

The word senate has passed into the constitutions of modern states, being sometimes applied to the second chamber of a legislature of two houses. Canada, Australia, S. Africa, Italy, and the U.S.A. call their second chamber by this name. In Canada the senate consists of a varying number of representatives from each of the provinces of the dominion; the total number must not be more than 104. Senators are nominated for life. In Australia it consists of six representatives from each of the states (chosen for six years), and a similar principle prevails in the union of S. Africa, where the senate consists of 40 members, eight being nominated by the governor-general, and 32 elected, eight from each province. In S. Africa senators must be British subjects of European descent, at least 30 years of age. The Act of 1920 set up senates in both the parliaments of Ireland.

The senate of Italy is elected on a regional basis for six-year terms. Each region has six members. The U.S. senate is composed of 96 members, two being elected by direct popular vote from each state for a term of six years. The periods of office are so arranged that one-third of the senators retire at the end of every second year. Each senator at the time of his election must be at least 30 years of age, must have been a U.S. citizen for nine years, and must be an inhabitant of the state for which he is chosen. No senator may be a member of the cabinet or hold any other civilian office under the U.S.A. The senate is presided over by the vice-president. It has the sole power to try all impeachments. The president must obtain its "advice and consent" before he can make treaties (requiring the concurrence of two-thirds of the senators present) or appoint ambassadors, consuls, judges of the supreme court, and certain other public officers. In certain universities the governing body is called the senate or senatus. *See Cicero; Second Chamber.*

Sendai. Town of Japan. The capital of the prefecture of Miyagi, it stands near the E. coast of

Honshu, and is connected by rly. with Tokyo, 225 m. S. by W. It is the chief trade entrepot of the N. part of Japan, salt and fish being largely dealt in. It has large warehouses and stores, and in the 20th century has considerably extended as a manufacturing centre. Pop. 262,803.

Seneca. Lake in New York, U.S.A. The largest of a group of long, narrow lakes of glacial origin in the W. central portion of the state, it is 37 m. long, from 1 m. to 3 m. broad, and reaches a depth of 631 ft. The Seneca river drains it to Lake Cayuga. It is used by steamers, and has canal connexions with the Erie canal.

Seneca, LUCIUS ANNAEUS (c. 54 B.C.-c. A.D. 38). Roman rhetorician, called Seneca the Elder.

Born at Corduba (Córdoba) Spain, father of the philosopher, Seneca the Younger, and grandfather of Lucan, the poet, he was possessed of an amazing power of memory which enabled him to repeat verbatim speeches which he had heard delivered many years before. Most of his writings have been lost, but ten books of *Controversiae*, disputations on imaginary issues, and a fragmentary book of *Suasoriae* (exhortations) are extant.

Seneca, LUCIUS ANNAEUS (c. 4 B.C.-A.D. 65). Roman philosopher, dramatist, and statesman, known as Seneca the Younger. Son of the elder Seneca, he was born at Corduba (Córdoba), in Spain. Adopting a public career in Rome, he was appointed



Seneca the Younger,
Roman philosopher



Seneca the Elder,
Roman rhetorician
From a bust

as tutor to the young Nero, and after his accession continued in the closest association with him. His great influence over Nero was undoubtedly for good, for the first years of his reign, when Seneca virtually ruled the empire, were years of good government. Later, he fell into disfavour, and in A.D. 65 was accused of being privy to the conspiracy of Piso, and was compelled to commit suicide.

Seneca's character is not altogether without reproach; he had

some of the worst vices of the courtier, pandering shamefully to the whims of his imperial master, and he found it not inconsistent with the Stoic philosophy, of which he was a distinguished exponent, to amass a fortune equal to £3,000,000. Many of his works have been lost, but many have come down to us, including works on philosophy, morals, and science, the latter being of no scientific value. Nine tragedies have also been preserved, which, though quite lacking in dramatic instinct, had great influence upon the drama of the 16th century, being the only extant Latin models of this class of literature. Seneca is at his best in his writings on morals, which abound in passages of great eloquence. *Consult Seneca, F. Holland, 1920.*

Seneca Falls. Village of New York, U.S.A., in Seneca co. It stands on Seneca river, 41 m. W. by S. of Syracuse, and is served by the Lehigh Valley and New York Central rlys., and the New York state barge canal. It has manufactures of pumps, foundry and machine-shop products, boxes, hydraulic machinery, and gas engines. Settled in 1791, Seneca Falls, named after the waterfall (55 ft.) in the river, was incorporated in 1831. In 1848 Elizabeth Stanton, whose father had disinherited her, organized here the first convention for women's suffrage. Pop. 6,449. Cayuga Lake Park, a noted summer resort, is 2 m. away.

Senefelder, ALOIS (1771-1834). Austrian-born inventor of lithography. Born at Prague, then in Austria, Nov. 6, 1771, he tried authorship, privately printing his own books. While experimenting with copper and other materials of engraving to illustrate



Alois Senefelder,
German inventor

one of his works, he accidentally discovered a method of printing from a slab of Kelheim stone, and having slowly perfected this process, established it as a commercial undertaking. An account of it by him, published in 1818, made it universally known. He died at Munich, Feb. 26, 1834. *See Lithography.*

Seneferu or **SENEFERU**. Egyptian king. Although actually the last of the IIIrd dynasty, he is often ranked with the IVth dynasty be-

cause, as the predecessor of Cheops, he inaugurated the art and policy of the pyramid age. Reigning 29 years, he introduced the practice of extensive foreign campaigns. He seized the Sinai turquoise mines, established permanent garrisons there, and sculptured in the Wadi Maghara a rock-stela portraying himself in the act of slaughtering a Beduin. His conquest of the Sudan was accomplished with Nile craft 170 ft. long. Besides his Dahshur pyramid he built another at Medum, opened by Maspero in 1881, and re-examined by Petrie in 1891 and 1910. Now in three stages, 115 ft. high, it formerly comprised seven stages. Seneferu was an object of worship down to Ptolemaic times.

Seneffe. Village of Belgium. In the prov. of Hainault, it is 16 m. from Mons. Here, in Aug., 1674, the Dutch and their allies under William of Orange fought a stubborn but indecisive battle with the French under Condé. Here, too, on July 2, 1794, the Austrians were defeated by the French.

Senega (*Polygala senega*). A perennial herb of the family Polygalaceae. A native of N. America, it has a hard creeping rootstock with a ridge along one side, from which several stems arise. The lance-shaped leaves have rough edges, and the white flowers form a single spike. The rootstock, powdered or infused, or a tincture prepared from it, affords a stimulant and expectorant medicine. In an overdose it may act as an emetic and cathartic. It has been used in America as a remedy for snake bites. The active principles are probably glucosides.

Senegal. River of W. Africa. It has two main sources, the Bafing and the Bakoy, which rise to the W. of the watershed of the Niger and unite to form one river at Bafoulabé, 700 m. from the coast. Its general course is W. and N.W., and it falls into the Atlantic near the city of St. Louis. The Senegal is navigable in the rainy season as far as Kayes (*q.v.*).

Senegal. French colony and protectorate of W. Africa, the oldest colonial possession of France in Africa. Since the French first established themselves on this coast early in the 17th century the borders of the Senegal colony were gradually extended towards the E., but later, owing to administrative changes, the boundaries have been reduced by the establishment of other separate territories. The colony, which lies to

the S. of the Senegal river, consists of the four municipal communes of St. Louis (the capital), Dakar, Rufisque, and the island of Goree; and various territories under the direct administration of the governor, assisted by a general council. In the four communes the natives exercise the franchise, and with the Europeans elect two deputies to the national assembly. In the council Senegal is represented by three members. The climate is hot and unhealthy.

The colony is stated to be rich in minerals, but little has been done to make them commercially available. The chief agricultural products are ground-nuts, gum, millet, maize, and castor beans. The colony is traversed by two rlys., from St. Louis to Dakar, and from Thiés, a station on the first rly., to Kayes and Bamako in the French Sudan. There are two submarine cables, Brest-Dakar, and Brest-Casablanca-Dakar. Area, 77,730 sq. m. Pop. 1,720,000. *Consult* Le Sénégal, Sabatié, 1926.

Seneschal (Old Fr. from Teutonic, literally old servant). Medieval term for the steward or major-domo of a royal or noble household. Originally a superior domestic, the office grew in dignity, especially at the court of France, where in the beginning of the 11th century the grand seneschal became the person next in importance to the king. Head of the royal household and commander of the king's army, he also exercised judicial functions. The importance of the office in France ceased in 1191, but the greater feudal lords had their own seneschals, who eventually acted as bailiffs or agents. In England the equivalent office was steward, and the grand seneschal of France had his counterpart in the lord high steward of England. *See* Steward.

Senigallia OR SINIGAGLIA (anc. *Sena Gallica*). Coast city of N.E. Italy, in the prov. of Ancona. It is 15 m. by rly. W.N.W. of Ancona city. The harbour is small, but the place is a favourite summer sea-bathing resort. A settlement of the Gallic tribe of Senones, the Roman colony, founded c. 280 B.C., was destroyed by Pompey in 82 B.C. The bishopric dates from the 4th century. The rebuilt town suffered severely during the conflict between Guelphs and Ghibellines. It escaped with only slight damage in the Second Great War. Pop. est. 10,000.

Senility (Latin *senex*, old man). Changes which occur in the body and mind as a result of old age.

Physically, the most important changes are some hardening and thickening of the smaller arteries, this in turn leading to more obvious changes in the vital organs. The arteries become brittle, and rupture of an artery may cause apoplexy. The lungs gradually suffer from the continuous inhalation of atmospheric impurities, and the lessened mobility of the chest walls diminishes the breathing capacity. The teeth decay, or become loose and fall out, the tissues of the stomach and intestines undergo some degree of atrophy, and digestion is impaired. Muscles decrease in size, leading to wrinkling of the skin. Hair becomes grey and falls out. Bones become thinner, brittle, and more liable to fracture. The lessened blood supply to the grey cells of the brain results in lessened elasticity of intellectual power, lessened power to form new impressions, and impairment of recent memory, though early memories are well retained. A type of early senility showing all these signs is associated with atrophy of part of the pituitary gland.

Senior Training Corps. This pre-military organization of the British army is described under Training Corps.

Senlac. Ancient name of the place in Sussex where the battle of Hastings was fought in 1066. *See* Hastings, Battle of.

Senlis. Town of France. It stands on the Nonette, in the dept. of Oise, 32 m. N.N.E. of Paris. The chief building is the former cathedral dating from the 12th to the 16th centuries. Other churches are S. Pierre and S. Vincent, the latter once part of an abbey. The town walls still stand, as do 16 watch towers, and there are remains of the castle. Cotton goods and other textiles are manufactured. A Roman settlement, Senlis became early the seat of a bishop. The see was suppressed in 1801. The town was greatly damaged in the First Great War. Foch had his headquarters here on Nov. 8, 1918, when the Germans applied for an armistice. Pop. est. 7,000.

Senna (*Cassia*). Large genus of shrubs and herbs of the family Leguminosae. Mostly natives of tropical and warm climates, they have leaves broken up into two rows of leaflets, and the flowers are yellow. The dried leaflets of several species constitute the drug senna, of which the best kind (*Alexandrian senna*) is afforded by *C. acutifolia*, a native of the Nile region. It is obtained from wild

plants, and its chief active principle is cathartic acid. East Indian or Tinnively senna is the leaflets of cultivated *C. angustifolia*. It contains a lower percentage of cathartic acid. Senna is used as a purgative. See Cassia.

Sennacherib. King of Assyria, 705-681 B.C. Son of Sargon II, he undertook campaigns against Elam, Cilicia, Phoenicia, and Palestine. Although his siege of Hezekiah in Jerusalem was raised (2 Chron. 32), he despoiled and depopulated Judah, rebuilt Cilician Tarsus, 698, and destroyed Babylon, 689. To his improvements Nineveh owed its renown.

Sennar Dam. Dam on the Blue Nile. It is about 200 m. S.E. of Khartum, and was opened in 1926. It is 3,330 yards long. The flood waters of the Blue Nile, which come down from Abyssinia from May to Sept., are impounded in sufficient quantity to irrigate 3,000,000 acres of fertile soil.

Sens. City of France. It stands on the Yonne, in the dept. of that name, 70 m. S.E. from Paris. The chief building is the cathedral of S. Étienne, begun in the 10th century and finished only in the 16th. Features are fine sculpture, stained glass, and old bells. Other buildings include the churches of S. Savinien, of Roman origin, and S. Pierre, parts of the castle restored by Viollet-le-Duc, and the old palace of the archbishops. There are manufactures of cutlery and chemicals.

Sens was the capital of the Senones, hence its name, and an important place under the Romans. Its archbishop was primate of Gaul



Sennacherib, King of Assyria. From a bas-relief
British Museum

and for long Paris was in his diocese. Remains of many fine Roman buildings have been unearthed, and many Roman relics are in the museums. Pop. 17,329.

Sensation (late Lat. *sensatus*, perceived by the senses). Feeling or mental state resulting from the action of external stimulation due to some bodily organ connected by nerve fibres with the brain. It is an elementary process, incapable of analysis; unlike perception, it takes no account of any external object, being simply feeling. Sensations possess quality, intensity, and duration. They may be broadly divided into affective (pleasure, pain), and representative (taste, touch, smell, heat). See Nerve.

Sensationalism, SENSATIONISM OR SENSUALISM. In philosophy, the theory that sensation (*v.s.*) is the source of all knowledge. It is asserted that all our ideas are at bottom referable to sensation, but reflection is allowed to play a part as a necessary complement (Locke, Leibniz). Ideas are nothing but a rehash of old sensations, and even our reasoning powers are transformed sensations, habits produced by the association of these same sensations (Condillac, Hume, James Mill, Spencer).

Sense and Sensibility. Novel by Jane Austen, written 1797-98, and published anonymously in 1811. Well received

from the first, the story made its author's reputation, though her name was not publicly associated with it until after her death. Its title indicates the contrasting qualities of two sisters, who are finely individualised with that direct power of portraiture which was one of the author's chief gifts.

Sensitive Plant (*Mimosa pudica*). Prickly perennial herb of the family Leguminosae. A native of tropical America, it has much-



Sensitive Plant. The Brazilian *Mimosa pudica*. Below, with leaves expanded; top, closed

divided leaves, and minute red flowers crowded in globose heads. The leaves are divided into two pairs of primary leaflets, and these again into a large number of secondary leaflets. At the slightest touch each secondary leaflet folds up from the sides, the primary leaflet droops, then the main leaf-stalk hangs down. Leaves above the one touched then successively pass through the same movements. The shock is conveyed cell by cell to the swollen base, and the cells on its lower side contract by allowing their fluids to pass into the upper side, with a consequent collapse of the stalk. Similar sensitiveness, though in a less degree, is possessed by *M. sensitiva* and other species.

Sensitometry. Term in photography. Originally meaning the measurement of photographic sensitivity, it has been extended to cover all general investigation of the reactions of photographic emulsions to light. Such work involves setting up special apparatus and a laboratory technique capable of maintaining set standards as to the exposing light, the exposing machine or sensitometer, the processing and evaluation of the developed densities.

Senta. Alternative spelling for the Yugoslav town Zenta (*q.v.*).

Sentence. In law, the judgement pronounced by a court or a judge on a criminal. It is distinct



Sens, France. West front of the cathedral; the north tower (left) was destroyed 1845; the south tower dates from 1535

from punishment, for it is only a statement of the punishment which the court thinks proper, and may be altered by a higher court.

Sentence (Lat. *sententia*, way of thinking, opinion). In grammar, an assemblage of words, the sense of which is complete. It usually contains a subject and a predicate, but a single word, such as an exclamation or command, can express a complete sentence. Sentences may be simple, containing only one subject or predicate; compound, containing more than one subject or predicate; complex, containing one or more subordinate clauses.

Sentimental Journey, A. Work by Laurence Sterne. It was published Feb. 27, 1768, twenty days before its author's death, in two volumes, with the full title of *A Sentimental Journey through France and Italy*. The easy, witty, discursive narrative is by many critics regarded as Sterne's masterpiece. It was designed to be completed by a further two volumes.

Sentis or **SANTS**. Alpine peak in Switzerland, the highest mt. in the canton of Appenzell. It rises to a height of 8,215 ft., 6 m. S. of the town of Appenzell. The view from the summit, where there is a meteorological station, embraces Lake Constance and the Bernese Alps.

Sentry (perhaps med. Lat. *semitarius*, belonging to a path). Soldier posted at any special point to watch and guard. Sentries at camps and barracks ascertain that all persons seeking admission are duly authorised. On active service they may be posted in pairs to increase their confidence, and a sentry post consists of three or six men, so that some are resting whilst the rest are on duty. Each man is relieved every two hours. A sentry guarding a permanent point marches a fixed beat, but on active service in the field his duties are carried out by combat patrol.

Senusert. Name of three Egyptian kings of the XIIth dynasty. The word is also spelled *Senwosri* and *Usert(sen)*. Senusert I refounded Heliopolis, where an obelisk of his still stands; his pyramid is at Lisht. Senusert II, Manetho's Sesostris, built the Illahun pyramid, with a magnificent granite sarcophagus. Senusert III fortified Semneh for protecting the Sudanese trade, and built a pyramid at Dahshur. See Egypt; Karnak; Pyramids.

Senussi. Mahomedan order. Founded in 1835 by an Algerian, Sidi Mahomed ben Ali es Senussi, its headquarters were originally at

Alexandria. In 1843 the founder established near Benghazi the Zawia Baida or White Monastery. Removing in 1855 to Jarabub in the Siwa oasis, he died there in 1859. His son and successor, Senussi el Mahdi, removed in 1894 to Jof in the Kufra oasis; on his death in 1902 his nephew, Sidi or Sayed Ahmed, succeeded, after whose flight in 1916 el Mahdi's son Sidi Idris became head of the order.

Influenced by Wahhabite puritanism, Senussism sought to recapture the simplicity of early Islam as taught by the Koran. It prohibited music, dancing, tobacco, and coffee, and attracted to the desert oases between the W. frontier of Egypt and the Italian sphere of influence in Tripoli many who found Turkish rule oppressive and Christian toleration irksome. From 1896 onwards European influences were brought to bear and during 1902-13 French hostilities were prosecuted against the community, which exercised sovereignty over much of the central Sudan, and was powerful throughout the whole of N. Africa. The British in the First Great War conducted a campaign against the Senussi (v.s.). During the Italian regime in N. Africa, the tendency was for the Senussi to agitate for an independent state, and during the Second Great War many of them acted with the British 8th Army Long Range Desert Group, as scouts and guides. In 1949 a Senussi state was set up, with British authority, the emir enacting a constitution. See Cyrenaica; Kufra. *Consult* Mahdism and the Egyptian Sudan, F. R. Wingate, 1891; The Sanusi of Cyrenaica, E. E. Evans-Pritchard, 1949.

Senussi, CAMPAIGN AGAINST THE. British operation during the First Great War. Urged on by Turko-German intrigue, the Senussi invaded Egypt in Nov., 1915, under their chief, Sidi Ahmed, known as the Grand Senussi. They had an organized force of their own, which was supplemented by Arabs, Berbers, and Turks, the whole comprising upwards of 30,000 men, and including a number of Turkish officers, one of whom, Gaafer Pasha, directed their operations in the field.

Sir John Maxwell, the British commander-in-chief, withdrew the Anglo-Egyptian posts from Sollum and Sidi Barrani, and concentrated at Mersa Matruh a force of 3,000 men. On Dec. 11 and 13, 1915, Gen. Wallace drove back the Senussi S. and W. of the town, inflicting considerable losses on them

at the Wadi Shaifa. On Dec. 25 he defeated them in a battle at Gebel Medwa, a few miles from Matruh, and stormed their main position at Wadi Majid, whereupon they broke and fled to Halazin, 25 m. S.W. Reinforced by part of the South African brigade, Wallace attacked the Senussi at Halazin on Jan. 23, 1916, and completely routed them.

On Feb. 25, 1916, Gaafer attacked the British near Agagia, but next day Lukin utterly defeated Gaafer and took him prisoner. The British advanced to Sidi Barrani, and thence on to Sollum, reoccupying it on March 14, 1916. Meanwhile, the Grand Senussi had gone to the Siwa oasis, and in Feb. his troops, accompanied by himself, seized the Baharia, Farafra, and Dakhla oases, well to the S. of the Libyan desert, and comparatively close to the Nile.

In March, 1916, Sir Archibald Murray replaced Sir John Maxwell and took such energetic measures that the Senussi were driven out of Baharia and the S. oases, while the Grand Senussi took refuge in Siwa again. During May, 1916, the Italians cooperated with the British by depriving the Senussi of Barda and Mersa Moraisa, two ports on the Mediterranean.

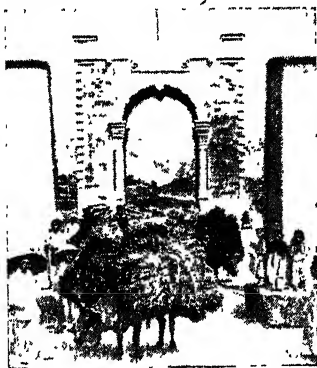
Seoni. District and town of the Madhya union, India, in the Jubbulpore division. The dist. comprises rugged tree-clad hills in the Satpuras with narrow fertile valleys between bare stony ridges. Rice, wheat, hemp, and pulses are the chief crops. The town is on the great road N. from Nagpur, and has rly. connexions with Nagpur, Chindwara, and Jubbulpore. Area, 3,206 sq. m.

Seoul. Capital of S. Korea. It is 25 m. from its port Chemulpo, with which it is connected by rly. The city was founded in 1394 and once had a wall 11 m. in circumference; some of the city gates still stand. Seoul is noted for its bell tower, with a bell dating from 1468. Under U.S. occupation 1945-1948, it then became capital of the republic of S. Korea. Pop. (1940) 756,890. See Korea in N.V.

Sepal (Lat. *separ* separate). One of the outer protecting whorls of floral leaves. The sepals collectively are known as the calyx, and if united by their edges the calyx is said to be gamosepalous. As a rule, sepals are green, but in the absence of petals they have to function as the attractive portion of the flower, and are brightly coloured. See Flower.

Separation. In English law, term generally used in relation to matrimony. It describes (1) the state of things that exists when a husband and wife cannot agree to live together, and enter into an arrangement for living apart; (2) a separation order by a magistrate; or (3) judicial separation.

No particular form of agreement is necessary for a separation by mutual consent. The agreement usually provides that husband and wife shall live apart and not molest one another, and that the husband shall pay a sum for the maintenance of the wife and children, if these are to be in the wife's custody. Some provision for varying the amounts payable by the agreement in the event of a change in the husband's income is usually included. The husband will be entitled to deduct income tax from payments made under the agreement unless this provides that he shall pay "such a sum as will after deduction of tax amount to £x per annum." Such a provision is burdensome on the husband. When husband and wife have thus separated, neither can later charge the other with desertion while the agreement remains in force.



Seoul, S. Korea. Independence Gate, commemorating Korea's independence from China in 1895

A separation order is made in the magistrate's court on the application of either wife or husband. A wife may obtain one when her husband has been convicted summarily of an aggravated assault on her, or convicted on indictment of an assault on her and fined more than £5 or imprisoned for more than two months; or has deserted her, or has been persistently cruel to her or her children, or has wilfully neglected to maintain her or her infant children, or is an habitual drunkard, or has com-

mitted adultery, or has insisted while suffering from venereal disease on having sexual intercourse with her, or has compelled her to submit herself to prostitution. A husband may obtain an order against his wife if she is an habitual drunkard, or has been persistently cruel to his children, or has been guilty of adultery. So long as a separation order is in force it prevents either party from contending that the other party is guilty of desertion. For this reason separation orders are now rarely made, the court usually making a maintenance order, i.e. an order that the husband shall pay a sum for the maintenance of the wife.

A judicial separation may be ordered by a judge of the divorce division of the high court on any grounds in which a divorce might have been obtained, or on failure to comply with a decree for restitution of conjugal rights.

Separation Allowance. Monetary payment made to the wife or other dependants of a man serving in the British navy, army, or air force. The amount varies according to the cost of living; in 1914 it was for the lowest ranks 12s. 6d. a week for a wife and 2s. 6d. for each child, and in 1948 had increased to 42s. for a wife and 9s. for each child. The rate rises with promotion to non-commissioned rank. In both Great Wars, a man who had lived with a woman out of wedlock for a stated period could claim a married man's separation allowance together with the appropriate sums for any children of the union.

In peace, men under 21 are not entitled to separation allowances if they are married before enlisting or wed without the permission of their commanding officer. To qualify for this allowance, the man must allot a fixed sum from his daily rate of pay. Dependants of married soldiers and airmen living in married quarters do not receive the allowance, which is consolidated as part of pay.

Officers over 25 are granted a flat rate marriage allowance taking account only of rank. In 1948 this was fixed at a maximum of £337 a year for a lieutenant in the navy and army and a flying officer in the R.A.F., falling on promotion to a maximum of £319. Officers make no qualifying allotment, and the allowance is added to basic pay.

Sephardim. Name given to the families and descendants of Jews driven out of Spain and Portugal. While their theology is

virtually identical with that of their German-Polish co-religionists, or Ashkenazim, they differ in their pronunciation of Hebrew, and their customs. See Ashkenaz.

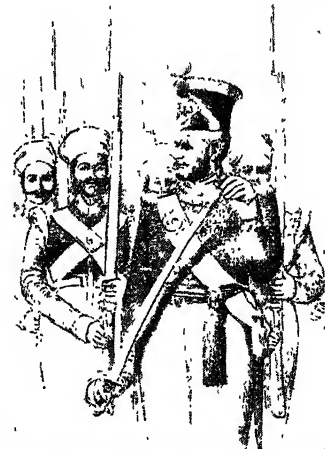
Sepharvaim. Ancient city of Syria. It has been identified with Sibraim (Ezek. 47, v. 16), which was situated between Damascus and Hamath. The name occurs in 2 Kings 17, v. 24, and 18, v. 34. Some authorities claim that it is identical with Sippara, a place near the Euphrates in Babylonia.

Sepia (Gr., cuttle-fish). Name of a genus of the order Cephalopoda of the phylum Mollusca. See Cephalopoda; Cuttle.

Sepia. Transparent brown pigment originally derived from the cuttle-fish, but now generally made from the juice of walnuts. It is much used in artists' drawings when it is desired to show the gradation of tones of one colour, and is often combined with pen-and-ink work and other means of heightening an effect. See Ink: Monochrome.

Sepiolite. This is the mineralogist's name for meerschaum (*q.v.*).

Sepoy (Persian *sipahi*, army). Anglo-Indian term for the native soldier in an Indian regiment, of the former British army in India, and cognate with the French *spahi*, an irregular horseman. The word is still applied in India and Pakistan to the infantry soldier as distinguished from the *sowar* or trooper. Sepoys were first raised in trained bands as factory guards by the East India Company in the middle of the 18th century, and formed the nucleus of the company's army in their struggle with the French. The first overseas expedition in which Indian troops



Sepoy. Bengal sepoys in the army of the East India Company

were engaged was the war with Spain in 1762, in which sepyo companies took part in the capture of Manila. During the next 150 years they were employed in various campaigns in Asia and Africa, but it was not until 1914 that they fought in Europe. In the Second Great War they fought in all theatres of war, distinguishing themselves particularly in N. and E. Africa, Malaya, and Burma; in Europe they took part in campaigns in France, Italy, and Greece.

Religious differences always provided problems for the white commanders of sepyo troops; notable in this connexion were the orders precipitating the Indian Mutiny (*q.v.*). See Indian Army.

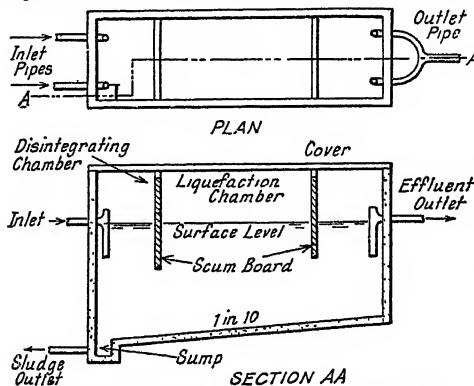
Sepsis (Gr., putrefaction). The process of poisoning by products of bacterial activity. It is more fully mentioned under Blood Poisoning. See also Antiseptic.

Sept (O.F. *septe*, variant of *secte*, sect). Group of related persons claiming descent from a common ancestor and paying fealty to one chief. The term was common in ancient Ireland, where the sept was a division of the tribe or tuath, of which it was an offshoot or colony. Freemen of the sept were theoretically related by blood, and bore the clan name with the prefix Ua, grandson, written O' in English. The sept owned common land, and the nobles had their estates, on which lived slaves and dependants.

In Scotland the sept was a branch of the clan; persons who were members of the clan, but outside blood relationship to the chief, had sept names, which were generally of two kinds, according to whether persons were related to the chief by marriage or bound to the clan by bond or manrent. A few septs took their name from territory; others from occupation. Thus a man's clan might be MacDonald, but his sept name Gow (Smith). After the proscription of 1745, many clansmen adopted sept names to conceal their identity, and many existing so-called clan names in Scotland were originally occupational sept names.

September (Lat. *septem*, seven). Seventh month of the old Roman and ninth of the Christian calendar. Like October, it was temporarily known by other names in honour of Roman emperors, e.g. Germanicus, from the surname assumed by Domitian to commemorate his defeat of the Chatti, a German tribe; Antoninus, in honour of Antoninus Pius; and Hercules,

from the surname taken by Commodus in allusion to his enormous strength. September massacres is the name given to the wholesale butchery in the prisons of Paris, Sept. 2-7, 1792, when some 1,400



Septic Tank. Small tank shown in plan and section

aristocrats and royalists were put to death; and the members of the revolutionary commune responsible for the massacre were called the Septembrists.

Septennial Act. Act passed in 1716 fixing seven years as the extreme limit for the duration of a British parliament. In early times there was no such limit, parliaments being dissolved when the king wished or when he died. In 1694 the Triennial Act declared that no parliament should sit longer than three years. In 1716, however, the Jacobite rising had caused great unrest in the country, and to avoid the danger of a general election at such a time the Septennial Act was passed. It remained in force until 1911, when the Parliament Act (*q.v.*) limited the duration of a parliament to five years. In both Great Wars the sitting parliament passed annual Acts prolonging its life by a year at a time. See Parliament.

Septet or **SEPTUOR** (Lat. *septem*, seven). Musical term for a composition for seven soloists, whether vocal or instrumental.

Septicemia (Gr. *septikos*, putrefying; *haima*, blood). Form of blood poisoning in which microorganisms are present in the blood stream. See Blood Poisoning.

Septic Tank. Tank through which sewage passes sufficiently slowly for the solids brought in suspension to separate out. Solids heavy enough to sink settle in the bottom as "sludge"; those light enough to float rise to the top as "scum." As fresh sewage enters, "effluent" passes out. During its passage through the tank the

liquid sewage, also the sludge and scum, undergo chemical and biological changes, these varying with the different shapes, sizes, and mode of operation of the tanks. No septic tank can achieve

purification of sewage. The effluent always contains highly unstable and usually putrefactive compounds, which are liable to become offensive until oxidation is carried to the point of stability either in the soil by the native organisms, or in biological filters. The aim of the designers of septic tanks must always be to produce

an effluent amenable to harmless and inoffensive stabilisation in the soil or on a filter. See Sewage.

Septimer Pass. Alpine pass in Switzerland. It connects Bivio with Chiavenna, in canton Grisons, and was in Roman times and during the Middle Ages the chief pass in this section of the Alps. Now it has no longer a carriage road, and has been superseded by the St. Gotthard pass and tunnel. Its summit is 7,582 ft. alt.

Septuagesima (Lat., seventieth). Sunday nine weeks before Easter in the Christian calendar. This is actually the 63rd and not the 70th day before Easter, but the name arose because Quinquagesima is the 50th day before Easter, and Sexagesima and Septuagesima were applied to the Sundays respectively a week and a fortnight earlier. Septuagesima occurs as early as Jan. 18 and as late as Feb. 22. See Calendar.

Septuagint, **THE**. Greek version, commonly designated LXX, of the O.T. It is so called from the Lat. word *septuaginta*, seventy, because, according to a tradition, preserved by Philo, Josephus, and in the so-called Letter of Aristas to Philocrates, the translation of the Law (Pentateuch) was made by seventy or seventy-two translators. Tradition states also, no doubt with truth, that the translation was made at the instigation of Ptolemy Philadelphus (285-246 B.C.), the founder of a library at the Serapeum. On the whole the work of Alexandrian Jews, the version was made gradually and was not completed until nearly the beginning of the Christian era;

the style of different books varies greatly. In some, e.g. the Pentateuch, and Chronicles, it follows the Hebrew text closely, in others it is paraphrastic, and again in others, e.g. the Book of Job, it is full of obscurity. The Septuagint includes the O.T. Apocrypha, and it is noteworthy that these are not grouped separately, but interspersed among our canonical books. *See Bible; Hexapla.*

Sepulchre (Lat. *sepelire*, to bury). Tomb or other place of burial. The Holy Sepulchre is the name given to the tomb of Jesus Christ in Jerusalem. It is within the present wall of the city, and this has been held as a fatal objection to its genuineness, for burials never took place within the walls; but recent excavations go to show that it is outside the wall that existed at the time of Christ. The site was identified by Constantine, who built a church there, the successor to which now covers the supposed site of Calvary, as well as that of the tomb. The Holy Sepulchre, in the middle of the church, is now converted into a chapel and so encased with marble and ornamentation that it is difficult to realize that it is cut out of the solid rock. Around it are a series of chapels devoted to the purposes of the Latin, Greek, Armenian, and other churches. *See Holy Places; Jerusalem.*

Sequani. Tribe of ancient Gaul. Their canton lay chiefly between the Rhône and Saône, nearly corresponding to the French departments of Doubs, Haute Saône, and Jura, with part of W. Switzerland. Their capital was Vesontio, the modern Besançon. About 71 B.C. they called in a German army under Ariovistus (*q.v.*), against their rivals the Aedui. He gave them the nominal hegemony of central Gaul, exacting a third of their territory as the price, but on his defeat by Julius Caesar in 58 B.C. they became subject to Rome.

Sequence (Latin *sequi*, to follow). In music, the repetition or imitation on a higher or lower degree of the scale of a melody or harmonic progression. Sequences are of two kinds—tonal, in which the imitation is general, and the key is not quitted; and real, in which the imitation is exact, with the result that modulation ensues. In the repetitions certain licences

are allowed, e.g. the doubled leading note in the fourth chord of the first illustration.

Sequence is one of the most valuable devices available for the composer, but, as it tends to become mechanical, it is seldom that more than two repetitions are employed. Passages which follow the general idea without conforming to precise imitation are sequential.

Sequestration (Lat. *sequestrare*, to lay aside). Act of depriving one of something. It is used in Scots law for the act of taking possession of a bankrupt's property in order to deal with it for the benefit of his creditors. In England, during the Commonwealth, when estates were taken from Royalists, they were said to be sequestered.

In ecclesiastical law a writ of sequestration is a writ of execution against the holder of a living in the Church of England. When a benefited clerical defendant owes a debt for which judgement has been obtained, the plaintiff can procure this writ. It is directed to the bishop of the diocese, and orders him to enter into possession of the rectory and parish church, receive all income, and out of the receipts pay the judgement debt. In order that the services of the church may be carried on, the bishop is to appoint a curate, and assign him a stipend, which must be paid before the creditor gets anything.

Sequestrum. Piece of dead bone which has separated in the course of necrosis following an injury to a bone.

Sequin (Fr. from Ital. *zecchino*). Name of an Italian gold coin minted at Venice in the 13th century and used until the fall of the republic. Its nominal value was about 9s. 4d. Sequins were minted at Genoa, Bologna, and Rome till 1834, and in Austria till 1822. The name is now applied to small metallic disks or spangles used in ornamenting clothing. *See Ducat.*

Sequoia. Genus of evergreen trees of the large family Coniferae. Natives of California, they have a close-grained red timber, and grow to a gigantic size. *S. gigantea*, or mammoth tree, has been known to attain a height of over 300 ft. and a girth of 90 ft. *S. sempervirens*, or redwood, is a valuable timber tree. *See Wellingtonia.*

Sequoia (c. 1760–1843). Cherokee Indian scholar. A half-breed, also known as George Guess, he



Sequoia, the Cherokee scholar, from a statue Capitol, Washington

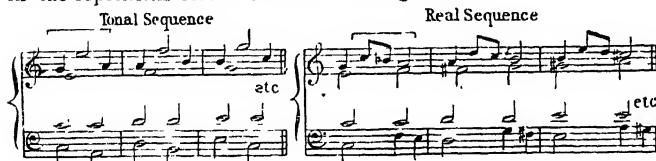
lived as a youth near Tuskegee, Alabama. He early appreciated the value of reading and writing, and between 1809 and 1821 invented a system by which every sound in the Cherokee language could be represented. The success of his system induced him to carry the new learning to the western tribes in Arkansas, 1823.

Serabit OR **SERABIT-EL-KHADEM** (Arab., the servant's pillars). Ancient turquoise mining settlement near the W. Sinai coast, also spelled Sarabit and Sarbut. In 1905 Petrie explored its IIIrd dynasty cave-shrine, with a Middle Kingdom forecourt added by Amenemhat III, and records of Hatshepsut and Rameses II. It was dedicated to Hathor, worshipped as lady of turquoise with Semitic rites.

Seraglio (Turk. *serai*, palace). Former residence of the sultan in Constantinople. It crowns the most easterly of the city's seven hills, and is surrounded by a wall, 2 m. round. Mohammed II commenced the buildings in 1468 and Suleiman II made considerable additions 1520–66; since 1839 it has not been in use and has fallen into decay. It contained the sultan's harem, and from this has come the use of the word for a place where women are kept for licentious pleasure. *Pron* Seral-yo.

Seraing. Town of Belgium, in the prov. of Liège. It lies on the right bank of the Meuse, 5½ m. by rly. W.S.W. of Liège, and is the centre of a busy industrial area, which includes such neighbouring towns as Jemeppe, Lize, Ougrée, Val-St. Lambert, and Flémalle. It is the seat of the famous iron-working and engineering firm, the Société Anonyme John Cockerill. Pop 43,000. *See* Cockerill's.

Serajevo. City of Yugoslavia, the chief town of Bosnia. It stands on the Miljacka, 122 m. S.W. of Belgrade, with which it has rly. connexion. Several fine stone bridges span the river. Ruins of a 13th century Hungarian castle





Sarajevo, Yugoslavia. General view of the city, showing the Town Hall in the left foreground

crown a hill above the town. Notable buildings are the R.C. cathedral (1889), the 16th century mosque of Husref Bey, the Konak, now the residence of the governor, and the town hall. Potteries, a brewery, and tobacco, silk-weaving, and dyeing factories are the chief industries. The assassination here of the archduke, Francis Ferdinand of Austria, on June 28, 1914, precipitated the First Great War. In the Second Great War German forces captured Sarajevo from the Yugoslav army, April 16, 1941, organized resistance by the Yugoslavs ceasing on the following day. The town was liberated by Yugoslav troops, April 6, 1945. Pop. 78,173. *Pron. Serrayayvo.*

Serampore. Town of West Bengal, India, in Hooghli dist. It is situated on the right bank of the Hooghli above Calcutta. There are large jute mills. The Car festival at the temple of Juggernaut (*q.v.*) is second only to that of Puri.

A Danish factory was established at Serampore in the middle of the 17th century and the settlement was called Frederiksnagore. It was transferred by treaty to the East India co. with the rest of Denmark's Indian possessions for £125,000 in 1845. Serampore became in 1800 the headquarters of Baptist missionaries, among whom was William Carey (*q.v.*). The house in which he lived and died is now in the precincts of the Serampore College established by the missionaries in 1818. The college has faculties in theology and confers its own degrees. The library contains first editions of Carey and Marshman's 40 translations of the Bible. The Danish church of S. Olaf's was built 1805 and the R.C. church 1776. The tomb of Carey is in the Baptist cemetery. Pop. 55,339.

Serang. Alternative name for the island in Indonesia better known as Ceram (*q.v.*).

Serapeum. Temple of Serapis. The most famous was at Alexandria, founded about 300 B.C., and converted into a Christian church, A.D. 389. The ruined Serapeum at Sakkara has bestowed its name inaccurately upon the anterior rock-cut Apis-tombs beneath. Ptolemaic and Roman Egypt had 40 Serapeums elsewhere, notably at Canopus and Oxyrhynchus. The market hall of Puteoli (Pozzuoli) is commonly called a Serapeum from a Serapis statue found there. *See* Pozzuoli.

Seraphim (Heb., Seraphs). Supernatural beings attendant upon Jehovah and guardians of His sanctuary. In the O.T. they are mentioned only in one passage (Isa. 6, v. 2). Elsewhere the same word, *sārāph*, means serpent (Num. 21, v. 6; Isa. 14, v. 29, 30 *v. 6*). This



Seraphim, as depicted by Raphael in his painting *The Vision of Ezekiel*
Pitti Palace, Florence

suggests, that the Seraphim attendant upon the deity were conceived originally as serpent-deities. The term is familiar from the Prayer Book canticle *Te Deum Laudamus*.

Seraphine. Name given to an instrument made in England, in imitation of the German Physsharmonica. It had free reeds and bellows. The tone was somewhat harsh, but the chief factor in preventing any instrument of this kind from being accepted was the invention of the harmonium (*q.v.*).

Serapion (*fl. c.* 350). Father of the Church. A zealous antagonist of the Arian heresy and an adherent of Athanasius, he was bishop of Thmuis, in Africa. His fame rests on his prayer-book for the use of bishops, the MS. of which, discovered on Mt. Athos in 1894, appeared in English in 1899.

Serapis or **SARAPIS.** Greco-Egyptian deity. Ptolemy I Soter introduced to Alexandria a Greek Hades-image; this was Serapis, and for its worship he erected the Serapeum. Deemed to represent an Egyptian Osiris-Apis, the new cult, in association with Isis, gained prompt recognition in Egypt, and spread thence through the Greco-Roman world.

Serbia. Former kingdom of Europe, since 1918 a federative unit of Yugoslavia, of which country it forms the large E. portion. As such it covers approx. 34,000 sq. m., with a pop. of 5,795,724. The area corresponds roughly to the medieval kingdom of Rashka. At various times during the Middle Ages parts of Bosnia and Herzegovina were under the Serbs.

The Serbs are a branch of the Slavs who invaded the Balkan peninsula in the 6th and 7th centuries. The Serb speech is identical with the Croat, the only difference being that the Serbs use the Cyrillic alphabet, and the Croats the Latin. The typical Serb is a tall, broad-headed man, with grey or blue eyes, and light or brown hair, resembling very much the original Slav invaders. These were loosely organized in government. The Serbs settled in the Montenegrin area (Zeta), and in the Novi Pazar area (Rashka). Here they were protected by strong barriers of forest and mountain against foreign invaders, and nurtured their strength. The Byzantine em-



Serbia arms

perors and the Bulgarian kings fought for the possession of Macedonia and Serbia, while two small, strong peoples grew up in Zeta and Rashka. The first important event in Serbian history was their conversion to Christianity by the Slavonic Apostles Cyril and Methodius, in the middle of the 9th century. Zeta and Rashka thus became, and have remained, Greek Orthodox in religion.

Medieval Serbia

Zeta developed a political organization, and in the mid-11th century became a fairly strong and stable kingdom. In 1186 Stephen Nemanya united Zeta and Rashka, and founded the Nemanyid dynasty. His son, Stephen I, was crowned king of the united Serbian kingdoms. From this time forward medieval Serbia was a powerful and important state, the more powerful and important because both the Bulgarian kingdom and the Byzantine empire were declining. Her true period of greatness came under Stephen Dushan (1331-55), a really notable medieval king and warrior. While still a sub-king, under his father Stephen Urosh III, he had led the charge which defeated a great Bulgarian host at Kustendil, 1330. In a series of campaigns he annexed all Macedonia—except Salonica—as well as Albania, Thessaly, and Greece as far as Arta and Volo. He finished his work by having himself crowned as emperor of Serbs and Romans (i.e. Greeks) in 1346. Shortly afterwards Dushan issued the Zakonik, an important code of Serbo-Byzantine law. His last years were occupied with making preparations for the conquest of Constantinople. These were unfinished when Dushan died. A critical moment in the history of the East thus passed by, for a Serbian conquest of Constantinople might have had very momentous results.

Stephen Dushan's reign established in the eyes both of contemporaries and of posterity the tradition of Serbia's predominance in the Balkans. Without Dushan's military capacity and political ability, the claim could not have been made good. The limits of Stephen Dushan's empire became the ideal of the Serbs, but his empire did not include the Croats, Dalmatians, or Slovenes of the West. Hence his influence tended on the whole to drive the Serbs away from the ideal of uniting the brethren of one language under one

dominion, and to bring them in contact with their remote kinsmen in Macedonia, and their bitter enemies in Albania.

Even in Dushan's lifetime the Turks had begun to press into Europe and had established themselves on the European side of the Dardanelles in 1354. Immediately after Dushan's death his great empire fell to pieces. The Serbs were first defeated by the Turks in a battle at Tchernom on the Maritza, 1371, and finally on June 15, 1389, in the famous battle of Kossovo, where the Serbian king Lazar was killed. The defeat



Serbia. Gata dress as worn by peasants of the old kingdom of Serbia

of Kossovo is remarkable as having become the source of all the historic legends and memories of the Serbs. Though a defeat, it is as renowned as if it were a victory, and it is the celebration of this defeat which has welded together the Serbian people in days of disaster. It is equally remarkable that the favourite Serbian hero Marko Kraljevitch, whose deeds are told in every Serbian family today, was really a vassal prince of the Turks, and probably helped them to crush his fellow-countrymen at Kossovo.

The medieval Serbian empire was not finally crushed at Kossovo. The last fortresses were not wrested from Serbian hands until 1459. The Serbian state fell rather from its own weaknesses than from Turkish attacks, and the inability of the Serb princes to combine against the Turk is an illustration of their fatal lack of political unity. One small fragment of the Serbian race continued, even to the 20th cent., to assert a precarious independence on the heights of Montenegro.

The Turkish conquest of Serbia did not at first weigh heavily on the population. It was not until 1593 that any serious rebellion took place, though in point of fact wholesale immigrations of Serbs into S. Hungary had taken place ever since the 15th century. In 1690 the Austrian armies had occupied Serbia and, when they were compelled to retreat, the Serbian patriarch of Ipek followed them with a very large number of Serb families. The actual Turkish occupation became seriously oppressive towards the end of the 18th century.

Unrest began in 1793-94, and revolt broke out in 1804 under the leadership of Kara George, the national hero of Serbia and the ancestor of the last ruling house. He gradually organized a government. He was finally defeated and compelled to fly the country in 1813. But in 1815 the revolt burst out again under Kara George's rival, Milosh Obrenovitch, who defeated the Turks and maintained his position by great diplomatic skill. Finally he got the Turks to acknowledge him as a vassal prince, and his position of virtual independence was confirmed in 1829. The position was, however, highly anomalous, and it was not until 1867 that Turkish garrisons were finally expelled from Serbia, and not until 1878 that Serbia's complete independence was acknowledged by Turkey.

Murder of King Alexander

Under King Milan Obrenovitch (1868-89) and his son Alexander (1889-1903), Serbia followed in the train of Austria-Hungary. Alexander, the last Obrenovitch, was murdered by some of his officers in 1903 in circumstances of atrocious cruelty. The crown was then offered to and accepted by Peter Karageorgevitch, the grandson of the original Kara George. His reign marked a new era, a relatively constitutional regime and a pronounced pro-Russian policy. In 1912, in cooperation with Greece, Bulgaria, and Montenegro, Peter went to war with Turkey and acquired the new territories of Macedonia and Novi Pazar, and more than one million new subjects. In 1914 Austria declared war on Serbia, and ultimately King Peter acquired eight million new subjects and the new territories of Montenegro, Dalmatia, Croatia, Symia, Voivodina, and Slovenia. Since 1914 the old king had handed over the active power to his son Alexander, who became king of Yugoslavia in 1921.

FIRST GREAT WAR. The First Great War began with Austria's declaration of war on Serbia, July 28, 1914, and next day the Austrians began to bombard Belgrade, and on Aug. 12 crossed the Drina into Serbia.

This was the first of three unsuccessful invasions by Austria between Aug. and Nov., of which the most successful was the third, when Belgrade was occupied. But the Serbs counter-attacked on Dec. 2, and by Dec. 14 had driven the invaders back. The next day King Peter in Belgrade cathedral gave thanks for victory.

But in repelling these invasions Serbia incurred losses which she could not make good, and during the ensuing winter and spring the ravages of pestilence weakened her still more. When in Oct., 1915, she was called on to withstand a fourth invasion, this time by German troops in combination with Austrians, under the German Mackensen, her strength was much reduced. She might, however, have held her ground had it not been for Bulgaria, who attacked her on the E., where her frontier was about 300 m. long, outflanked her on the S.E., and made victory for her a strategical impossibility. By the Salonica expedition the Allies tried to assist her, but failed. Serbia put into the field every man who could hold a rifle, but their total number was under 300,000, as against 600,000 Germans, Austrians, and Bulgarians, and in the face of far more powerful artillery. Her allies advised a defensive retirement, and promised help, but it came too late, and was inadequate.

The attack opened Oct. 6. Belgrade was evacuated Oct. 8. Within a month the larger part of Serbia, with most of the important rly. to Constantinople, possession of which had been Germany's real preoccupation, was in the hands of the invaders.

By the end of the month the Serbian N. forces had retreated into the mountains of Montenegro and Albania. The S. Serbian troops retreated into Albania, Monastir being evacuated on Dec. 2. Serbia was overrun and conquered by Dec. 7, but as her army was not utterly destroyed, the chief design of her conquerors was frustrated. Despite dreadful sufferings in the retreat to the coast, more than 100,000 men ultimately reached Corfu, where they were rested and refitted by the Allies, and again became a magnificent fighting force

During Sept., Oct., and Nov., 1916, the reconstituted Serbian army, transported from Corfu to Salonica and thence to the Macedonian front, played a great part in the operations that led to the recapture of Monastir (*q.v.*), and it was prominent in the fighting that took place in March and in May, 1917, in the Cherna Bend and Dobropolye sectors respectively. But, apart from trench warfare, it did not engage in any movement of importance from that time to the opening of the great Allied offensive under d'Espérey which began on Sept. 15, 1918. The Serbs occupied the mountain line, and French and Italian divisions continued the Allied front to the Adriatic. In all the Allied strength was about 400,000 men. W. of the Vardar the enemy front was held by the 1st Bulgarian army, and E. of it by the 2nd Bulgarian army, both being supported by the 11th German army, then quartered in Serbia. In Albania a considerable Austrian army opposed the Allies. The total strength of the enemy was equal to that of d'Espérey, who, however, had the disadvantage in positions. By nightfall on Sept. 15, the Serbians, with the French in union, had taken Sokol, Dobropolye and Vetrenik, and broken the Bulgar front. Next day they stormed Golobilo, and took Kozjak, the centre of the second Bulgarian line, making a gap ten m. in width and five m. in depth. On Sept. 17 the Allies gained some further ground, and next day the Serbs were

across the Cherna and were marching on Prilep. See Salonica.

On Oct. 22 the Serbs were in Krajevo, and on Oct. 25 in Kragujevatz. They reached the Danube between Semendria and Belgrade on Oct. 30, and were again in Belgrade on Nov. 1, 45 days after the beginning of d'Espérey's offensive. By Nov. 3 Serbia was entirely liberated, and her troops were crossing over into Bosnia, while at the same time the Yugo-Slavs in Austria were taking steps towards the union of all the Slavs of the S. into one great kingdom under the leadership of Serbia.

Serein. Term applied to fine rain falling from an apparently cloudless sky. It is a very rare atmospheric phenomenon, and probably only occurs when the air is temporarily supersaturated with moisture. It was observed in the S. Atlantic by Sir James Clark Ross in 1839, at Geneva in 1837 and 1838, and has occurred at Istanbul and on Mauritius. Snow fell at several places in England from a cloudless sky in 1895.

Serenade. (1) Primarily, a song sung at night, conventionally by a lover beneath his mistress's window. The singer accompanies himself on a guitar or similar instrument, and the accompaniment is accordingly characteristic. (2) As an instrumental composition of similar style, a serenade generally comprises a number of short movements. Mozart's Haffner Serenade, Beethoven's Trios Op. 8 and Op. 41, and Brahms's Op. 11 and Op. 16 may be mentioned as examples.

Serenata (Ital.). A term which, though etymologically the same as serenade, means musically something different. (1) It was a form of cantata: Handel called his *Acis and Galatea* a serenata. (2) In the 18th century it also meant a kind of suite intended for private performance, and scored for varying combinations of instruments. The *bourrée* and the *gavotte* were omitted from it, but the march and the minuet were almost invariably included.

Sereno. Spanish name for a watchman who makes the round of the streets by night. These men a kind of night police, generally sing out with characteristic cries the hour of the clock and the state of the weather.

Serer. Negroid people in Senegal, French W. Africa. Mostly between Cape Verde and the Salum-Gambia watershed, they are a large-chested and weaklimbed people, averaging 5 ft 8 ins in height, but often much taller.



Serer. Women workers and (top) man of the negroid tribe

and are less black and thinner lipped than the neighbouring Wolof. Their ruling families display strong Mandingo traits. Many are nominally Mahomedans, but nature-worship is prevalent. They are inclined to intemperance.

Seres, **SERRES**, OR **SIRIOS**. Town of Greece, the ancient Seris or Sirae. In E. Macedonia, 45 m. N.E. of Salonica, it is the capital of a dept. of the same name, with a cotton industry, and a trade in grain, rice, tobacco, wool, hides, and silk cocoons. It is the seat of a Greek archbishop. Seres was occupied by the Bulgars in 1916 by collusion with the Greek government, and evacuated by them in Oct., 1918, after the armistice granted to Bulgaria by the Allies. Pop. (1938) 29,640. The department had a pop. of 216,569 in 1938.

Seret (Rum. Siretul). River of Rumania. It rises in the Bukovina, and flows S. across Moldavia in a steep-sided narrow valley to join the Danube 5 m. above Galatz. The Little Seret, Suczawa, Moldava, and Bitritz are its chief affluents. Its length is 291 m.

The river gives its name to a battle of the First Great War, fought between Russians and Austro-Germans, Sept., 1915. The Russians attacked from a line on the Seret, Sept. 7, and fierce fighting raged for the rest of the month. The Austrians fell back, on a $5\frac{1}{2}$ m. front, towards the Dniester. The Russians took 100,000 prisoners.

Serf (Lat. *servus*, slave). In feudal usage, a member of the class of peasants bound to the land of their master, which they cultivated. The serf could not own land himself, nor could he leave the land without the lord's consent; he paid a rent in money or kind, rendered other dues in personal labour (e.g. the typical French *corvée*), and could pass on his tenure to his heir only on a fixed payment by the latter to the lord; the lord had full right of disposing of the serf with the land he occupied, but could not transfer the serf to another master except with the land as well.

Historically, serfdom may be regarded as a form of the earlier slavery, modified in certain respects by the example of the late

Roman colonies, where systems of protection in return for services rendered were in operation, and to some extent by the humanising influence of the Christian church, e.g. in that the serf had the right of contracting marriage. The influence of the German village community has been disputed by modern scholars. The early



Seres, Greece. The ancient Greek fortress, situated on a hill which dominates the old town

medieval forms of serfdom were gradually modified by such means as the granting to certain towns of rights of refuge to serfs who had deserted their masters, and by rights of emancipation on certain conditions, e.g. by purchase, or, as was common during the Crusades, by giving military service.

The origins of English serfdom and its exact relationship with the Saxon ceorl's status are obscure. At the time of Domesday the bulk of the population were villeins, but these cannot properly be described as serfs, although economically they were a dependent class. Below them, however, were others, who can fairly be described as such. The condition of the villeins seems to have deteriorated during the centuries after 1066, and there are cases on record of individuals being sold by their lords. The break-up of the manorial system, the economic changes brought about by the Black Death, and the growth of the towns put an end to the serfdom of many, and by the end of the 16th century the custom was extinct.

In Scotland, however, colliers and salters remained serfs until late in the 18th century, when they were emancipated by statutes 15 and 39 Geo. III. In France the institution survived in many districts in a modified form until the Revolution, when it was abolished with feudal obligations and other relics of medieval law and custom. The liberal emperor, Joseph II, decreed the abolition of serfdom

in his Austrian and Bohemian dominions, 1781-82, but the system was not entirely ended in the empire until 1848.

In Prussia serfdom was deeply rooted and widespread, especially on the great estates in the East, where it had grown up through the conquest of the native Slav population, and was enforced through the adoption of Roman law. Its asperities were gradually mitigated in the 18th century, and in 1807 the minister, H. F. von Stein, effected the emancipation, by decree, of the Prussian serfs, and secured for all citizens the free choice of occupation. Other German states followed, but in Upper Lusatia the serfs were not freed until 1832.

In Russia the peasants fell into a condition of serfdom early in the 17th century, and the only result of their violent insurrections was that the system was legally enforced in 1648, and made more severe by Peter the Great. The partition of Poland, where legislation in the 16th century had turned masses of peasantry into serfs, swelled the servile population of the empire. The virtual enslavement of millions of peasants to the land-owning class was a constant source of unrest.

As a result of the Crimean War, the tsar Alexander II began the emancipation of the Russian serfs by liberating those on the imperial domains in 1858, and completed it by the Act of Feb. 19, 1861, which came into full effect in 1863. In all about 23,000,000 serfs were set free. The landowners were compensated, and the peasants, who received allotments, paid for their emancipation by yearly instalments. See Feudalism; Manor; Slavery; consult also Villainage in England, P. Vinogradoff, 1892.

Serge (Lat. *sericum*, Seric, i.e. Chinese stuff; silk). Twilled cloth of worsted or of worsted warp and woollen weft, used chiefly for clothing and usually dyed dark blue or black. "Silk serge" is a twilled silk serge-like fabric used for coat linings. On account of its durability serge has long been a popular clothing material. It was formerly used chiefly for curtains and coverlets; Samuel Pepys recorded in his Diary in 1660 that his dining-room was furnished with green serge hanging.

Serge (1857-1905). Russian grand duke. Born May 11, 1857, the fourth son of Alexander II, he became gov.-general of Moscow, and incurred the displeasure of Nicholas II when during the coro-

nation ceremonies of 1896 2,000 people were crushed to death. Regarded as the leader of the reactionary party in Russia, he was killed by a bomb while driving in Moscow, Feb. 17, 1905.

Sergeant (Lat. *serviens*, serving). Non-commissioned rank in the British army, Royal Marines, and R.A.F., also in most foreign armies. The rank is above that of corporal and below that of staff-sergeant. In the R.A.F., sergeant is the lowest rank granted to aircrew personnel. The duties of a sergeant are to maintain discipline, to instruct, and to command one or two sections in the field. A sergeant of artillery has charge of a gun crew. Insignia of rank are three inverted chevrons worn above the elbow, except on the Royal Marine greatcoat, where they are carried on the cuff. Corporal of horse in the Household Cavalry is the equivalent of sergeant.

Sergeant-Major. A warrant officer in the British army. He is the senior warrant officer (Class I) of a regimental unit and has under him four company, battery, or squadron sergeant-majors (warrant officers Class II), according to the arm of the service. Infantry sergeant-majors generally command a platoon in the field. Insignia of rank are the royal arms for regimental sergeant-majors and a crown for company, battery, or squadron sergeant-majors. When not in battle-dress, sergeant-majors wear officers' service dress with Sam Browne belt.

Sergipe. State of Brazil, S. America. It is the smallest state of the republic, having an area of only 15,089 sq. m. It lies N.E. of Bahia, being separated from Alagoas by the São Francisco. The coastlands are low and flat, the interior has fertile areas, grass land on which there are large herds of cattle, and forests. Sugar, rice, cotton, coffee, maize, cocoa, tobacco, flax, and rubber are produced. The chief town is Aracaju. Pop. 542,000.

Sergius. Saint and martyr. Little or nothing is known of him, but he is believed to have been a soldier who suffered for the faith in the early days of Christianity. His festival is kept on Oct. 7.

Sergius. Name of four popes. Sergius I was pope during 687-701, and Sergius II, 844-847. Sergius III, pope 898-911, only obtained the papal throne after putting two rivals to death. Sergius IV was pope 1009-12. See Papacy.

Seri. American Indian tribe on Tiburon Island, Gulf of California, and the adjacent coast. Occupying

primitive huts, they use cane rafts and bows and arrows. Their animal food is mostly raw, their only domestic animal the dog, and they cultivate nothing. Mother-right is strict. They number some 300.

Series. In mathematics a series is distinguished from a sequence by writing plus (or minus) signs between the terms; a sequence is a set of numbers arranged in a given order. Interest attaches chiefly to those sequences in which successive terms are derived according to a fixed rule. For example, in an arithmetical progression each term is formed by adding a fixed quantity to the preceding term; if a is the first term and d the common difference, the sequence is $a, a+d, a+2d, \dots$, and the n^{th} (or general) term is $a+(n-1)d$. In a geometrical progression each term is formed by multiplying the preceding term by a fixed quantity: if a is the first term and r the common ratio, the sequence is a, ar, ar^2, \dots , the n^{th} term is ar^{n-1} , and the sum of n terms is $a(1-r^n)/(1-r)$. (See Progression.)

If the number of terms in a series is limited the series is said to be finite and can be written: $a_1+a_2+a_3+\dots+a_n=\Sigma a_n$.

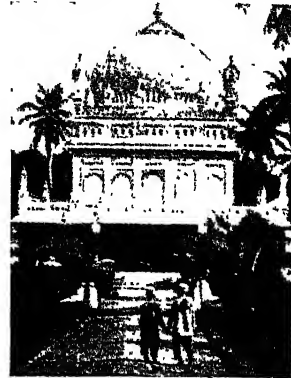
If the number of terms is unlimited, the series is said to be infinite. The sum (or value) of an infinite series, however, is not necessarily infinity. Consider the series of n terms

$$S_n = a + ar + ar^2 + \dots + ar^{n-1} \\ = a(1-r^n)/(1-r).$$

If $r > 1$, then as n is increased indefinitely, r^n will increase indefinitely, and hence S_n will increase indefinitely. The series is then said to diverge to infinity, or the series is divergent. It is also divergent for $r=1$, and (to $-\infty$) for $r < -1$. Where $r=-1$ the series reduces to $1-1+1-1+\dots$; if n is even $S_n=0$, if n is odd $S_n=1$; in this case the series is said to oscillate. Where, however, $-1 < r < 1$, r^n will tend to 0 as n increases indefinitely. Also S_n will tend to a limiting finite value which can be found from the summation formula:

$$\lim_{n \rightarrow \infty} S_n = \lim_{n \rightarrow \infty} \frac{a(1-r^n)}{1-r} = \frac{a}{1-r}.$$

The series is then said to converge to $a/(1-r)$. For a series to be convergent it is necessary that the n^{th} term should tend to 0 as $n \rightarrow \infty$; but this is not sufficient. The harmonic series $1+1/2+1/3+1/4+\dots$ can be shown to be divergent. Many tests have been devised to discover if



Seringapatam, India. Mausoleum of Tipu and Haider Ali

particular series are, or are not, convergent, but no completely general process is available.

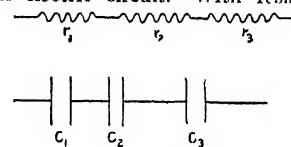
A series of the form $b_0+b_1x+b_2x^2+\dots+b_nx^n+\dots$, or more generally $b_0+b_1(x-a)+b_2(x-a)^2+\dots$, where a is a constant and the coefficients b_0, b_1, b_2, \dots are independent of x , is known as a power series. Many transcendental functions can be expressed as power series, which when convergent enable values for the functions to be computed to any required degree of accuracy. Thus $\sin \theta = \theta - \theta^3/3! + \theta^5/5! - \theta^7/7! + \dots$; $e^x = 1 + x + x^2/2! + x^3/3! + \dots$; or in general (Maclaurin's series) $f(x) = f(0) + f'(0)x/1! + f''(0)x^2/2! + \dots$. The binomial series:

$$1 + kx + \frac{k(k-1)}{2!}x^2 + \dots$$

gives the value of $(1+x)^k$ for any real k .

Consult A Course of Pure Mathematics, G. H. Hardy, 1941.

Series-connexion. A method of connecting the components in an electric circuit. With resist-



Series-connexion. See text

ances, one current flows through all and the combined resistance is equal to the sum of the separate resistances, i.e.

$$R = r_1 + r_2 + r_3 + \dots$$

With condensers, the reciprocal of the combined capacitance is equal to the sum of the reciprocals of the separate capacitances, i.e.

$$1/C = 1/c_1 + 1/c_2 + 1/c_3 + \dots$$

Serif. Term in typography and printing, denoting the minute projecting turns or portions at the

extremities of a letter. Derived from the characteristic flourish of the broad-pointed pen, they were stylised by the Romans in their classic carved inscriptions on monuments, etc., and have been generally adopted by typographers using the Roman alphabet. *See Sans-serif.*

Seringapatam. Town of Mysore, India. Situated on an island in the Cauvery river, 9 m. N.E. of Mysore, it was the old capital of the state in the days of Tippoo and Haider Ali, and contains their tombs, Tippoo's mosque, and the ruins of his palace. Tippoo was mortally wounded in 1799 when the fort was stormed by British and Indian troops. Pop. 10,000.

Seringapatam. *SIEGE OF.* Incident in the campaign against Tippoo Sahib, 1799. On the entry of the British into Mysore in 1790, Tippoo invaded the country and established himself in Seringapatam, which he fortified strongly. In 1791 Cornwallis made a demonstration before the town, and gained a decisive victory the next year, which deprived Tippoo of much of his territory. The latter retained Seringapatam, however, and held it until General Harris arrived before it, April, 1799. After besieging the fortress a month Harris made a breach in the S. wall, which faced the Cauvery river, May 4, 1799. The city was bravely defended, and Tippoo Sahib lost his life fighting in the breach. *See* Cornwallis; Tippoo Sahib.

Serious Call. A. Religious treatise by William Law, published in 1728, with the full title: *A Serious Call to a Devout and Holy Life, adapted to the State and Condition of All Orders of Christians.* Clear and vivid in its literary style, and embodying descriptions of typical characters often rendered with pungent satire and irony, the book won praise from Johnson and Gibbon, and is the best remembered of its author's works. *See* Law, W.

Serjeant. An alternative and older spelling of the non-commissioned rank in the British army, etc., usually spelt sergeant and so entered in this work.

Serjeant-at-Arms. Title of certain officers of the British royal household. One is the lord chancellor's mace-bearer and attendant in the house of lords, and another performs similar functions for the Speaker in the house of commons. The Speaker's serjeant-at-arms also enforces order and expels and arrests members. The other serjeants-at-arms have ceremonial

duties of various kinds in the royal household (*q.v.*).

Serjeant-at-Law. In England, a legal order, now extinct. Serjeants existed in the 13th century or earlier, and before Q.C.s were appointed by Elizabeth the rank was the highest open to barristers.

Until 1845 serjeants-at-law had a monopoly in the court of common pleas in term time, but not in vacation. They sat within the bar, and until 1873 no one was appointed a common law judge unless he was a serjeant. Their mark of office was a coif or skull cap; after the introduction of wigs a serjeant's wig was made with a hole in the top so that the coif showed through. They had their own inn, Serjeants' Inn (*q.v.*), and enjoyed state precedence. After 1873 appointments ceased. The word comes from the Latin *serviens ad legem*, serving the law. *See* Barrister; Coif.

Serjeantry or **SERJEANTY.** In the feudal system, a system of land tenure by which the tenant rendered to the crown a definite personal service. Two classes of serjeantry were generally found in practice: grand and petty (or petit) serjeantry. In grand serjeantry the service required as condition of tenure was directly personal. In petty serjeantry a yearly tribute had to be made by the tenant of some article or articles pertaining to war, *e.g.* a bow or a sword. Relics of this custom have survived in England, *e.g.*

the estates of the dukes of Wellington are still held by an annual offering to the king of a flag. *See* Feudalism; Tenure.

Serjeants Inn. Name of two former inns in London, belonging to the serjeants-at-law (*q.v.*). One, destroyed by bombing in 1940, was a quadrilateral enclosure on the S. side of



Serjeants' Inn. Hall of the old inn, formerly at the southern end of Chancery Lane, London
From a drawing by T. H. Shepherd

Fleet Street, E.C. The other was near the corner of Chancery Lane and Fleet Street. The two societies combined in 1758, and occupied the northern inn until 1877, when the order of the coif was dissolved. *See* Inns of Court.

Sermon (Lat., discourse). Address on some religious topic, usually founded on a passage of Scripture, called the text, and given in church for the doctrinal instruction and spiritual comfort of the congregation. *See* Homily; Preaching.

Sermon on the Mount. THE. Name given to the collection of sayings by Jesus Christ comprised in Matt. 5-7. In these chapters the sayings are given as one long discourse addressed to the disciples after Christ "went up into a mountain." His descent from which is recorded in Matt. 8, v. 1. The sermon opens with the Beatitudes, and includes the Lord's Prayer (Matt. 6, vv. 9-13), as well as the essence of Christ's ethical teaching, *e.g.* Love your enemies (Matt. 5, v. 44). Another version of the Beatitudes and some of the ethical instructions are given in Luke 6, and of the Lord's Prayer in Luke 11. It is assumed that the contents of what Matthew presents as one sermon were in fact uttered on various occasions during Christ's ministry.

Serous Membrane. Membrane consisting of two layers, one covering the free surface of an organ and reflected back at the attachment of the organ to form the second layer, which lines the cavity containing the organ. Examples of serous membranes are the pleura, which covers the lung and the inner surface of the pleural cavity containing the lung, and the pericardium, which forms a sac enclosing the heart. The function of the serous membrane is to form a fluid called lymph, which



Serjeant-at-Arms.
The Speaker's mace-bearer

occupies the space between the two layers and facilitates gliding movements of the organ within its cavity, such as occur between the lung and the pleural cavity during respiration. Pleurisy is inflammation of this membrane so that the surfaces grate instead of sliding.

Serpa Pinto, ALEXANDRE ALBERTO DE LA ROCHA (1846-1900). Portuguese explorer. Born April 10, 1846, he entered the army and, sent with an expedition to Angola, crossed Africa, W. to E., 1877-79, recording his experiences in *How I Crossed Africa*, 2 vols., 1881. He made further journeys between Mozambique and Lake Nyasa, 1884-86, was in 1889 made governor of Mozambique, and became, as the result of an expedition he organized in the Zambezi region, a central figure in the trouble between Great Britain and Portugal which led first to the convention of 1890 and later to the *modus vivendi* of 1891, defining the spheres of the two countries. He died at Lisbon, Dec. 28, 1900.

Serpens. In astronomy, one of the ancient constellations, the serpent which Ophiuchus strangles. The head of the serpent is marked out by five stars in the shape of an X immediately below the semicircle of the Northern Crown. The tail comes to an end in a channel of the Milky Way. The constellation contains the globular cluster Messier 5. The chief star is Cor Serpentis, a star of about the third magnitude.

Serpent (Lat. *serpere*, to creep). Alternative name for the legless reptiles or snakes. The distinction is purely philological, serpent being introduced to the English language by the Romans, and snake by the Anglo-Saxons. In modern use serpent is applied to the larger species. See Ophidia; Reptile; Snake.

Serpent. Obsolete wind instrument of the cornet (*q.v.*) type. Invented by Canon Guillaume of Auxerre, it was generally made of wood in several pieces, joined together and covered with leather, but having a metal crook terminating in the mouthpiece. The conical tube was about 8 ft. in length, bent for convenience in handling into snake-like convolutions, this giving rise to the name. The normal compass was three octaves from C to c", and owing to the mechanical imperfections of the instrument, the scale was uncertain and the tone variable. Its soft, woody quality, however, made it a great favourite for church use. In France it sustained the plainsong, and in



Serpent, an obsolete musical instrument of the cornet type

England it was a common member of village church orchestras. Mendelssohn, Verdi, Wagner, and other composers employed the serpent, but the instrument has now been superseded, in performing their scores, by the ophicleide. The ancient Lysardon was probably a serpent.

Serpentine. In geology, a mineral, a member of the chlorite family. An hydrated silicate of magnesium $[Mg_3Si_4O_{10}(OH)_2]$, serpentine is commonly the product of decomposition of olivine which has been attacked by hot water or steam and carbon-dioxide. It is a soft, greenish coloured mineral, and when it develops in long hair-like or fibrous crystals it forms asbestos. Many large rock-masses are essentially of serpentine, and the same name is applied to the rock as well as to the mineral. Serpentine rock is usually the product of alteration of some ultra-basic igneous rock (*q.v.*), such as peridotite, which is rich in olivine. Serpentine occurs at the Lizard, Cornwall, in Scotland, and in the Shetland Isles, in the U.K. At Prato, Tuscany, a variety called *Verde di Prato*, and resembling bronze, is used for sculpture. Chromite and platinum deposits are often associated with serpentines derived from ultra-basic rocks. Altered impure magnesian limestones may also develop serpentine, in which case the white calcitic mass of the rocks is streaked or mottled with green, so forming an attractive ornamental stone termed serpentine marble or opicalcite, e.g. Connemara marble. Though soft, serpentine is durable, and its varying colours, and the fact that it will take a high polish, make it in great demand as an ornamental stone for vases, ash-trays, or interior decoration.

Serpentine, THE. Artificial lake in Hyde Park and Kensington Gardens, London. Caroline, queen of George II, during 1730-33 threw several ponds into one, and the sheet of water thus formed (41 acres) was fed by the Westbourne until 1834 when water was supplied from the river Thames. The

part in Kensington Gardens is called the Long Water. Boating and bathing in the Serpentine have long been popular pastimes. After leaving the park at Albert Gate the Serpentine becomes part of the London main drainage system. See Hyde Park; Kensington Gardens; Lido.

Serpent Worship. Religious cult of individual snakes, of snakes in general, or of deities or heroes regarded as assuming such forms. Of extraordinary variety, and almost universal range, serpent worship or ophiolatry has been the subject of much wild and often mystical speculation, generally unwarranted. The mysterious attributes of snakes aroused a sense of awe and veneration independently in many regions. Their renewal of youth by sloughing the skin suggested resurrection and immortality; their mode of progression, swiftly working poison, power of fascinating their victims, habit of haunting houses, tombs, and ruins, and emergence from subterranean holes, originated other ideas. Though snakes are commonly connected with the underworld, they are only occasionally regarded as evil powers. Ancestor-worship (*q.v.*) is often the basis of these religious cults.

In Genesis, as to the Babylonians and Aztecs, the serpent is a spirit of wisdom, and was worshipped as such by the semi-Christian sect of Ophites. A widespread connexion with healing is found in the brazen serpent of Israel, worshipped in Hezekiah's time, in the Greek cult of Aesculapius, and in W. African belief. Serpents are often worshipped as water spirits, and as such were propitiated by human sacrifices. They were also associated with the sun, as in ancient Egypt, or with lightning, as in N. America. As deities of fertility, they are attended by priestesses, as in the elaborate python cult of Whydah, W. Africa. See Dragon; Ophites; Uraeus; Voodoo.

Serpho, SERIPHOS, SERFANTO, or SERFO. Greek island in the Aegean Sea. It is one of the Cyclades, 24 m. W. of Syra, and has an area of 30 sq. m. Wine is produced. Livathi, at the head of a deep inlet, is the chief town and harbour. Pop. 4,000.

Serpukov. A town of the R.S.F.S.R. It is 60 m. S.W. of Moscow, on the Nara, near its junction with the Oka, and the Moscow-Kursk rly. It is mainly industrial, with factories for leather, linen, cotton, and cloth goods.

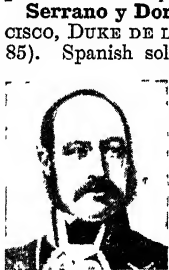
The cathedral dates from 1380, and was remodelled in 1710. Pop. 90,766.

Serpula. Genus of polychaete (many-bristled) marine worms, belonging to the phylum Annelida.

They construct the chalky tubes so often seen on the shells of scallops and other molluscs. The head bears beautifully coloured plumes, which appear to be sensitive to light and shadow, and thus warn the animal of the approach of danger. They have bright green blood, owing to the presence of a pigment, chlorocruorin, which has an affinity for oxygen like that of haemoglobin.

Serrano Suárez, RAMON (b. 1901). Spanish politician. Educated at Madrid and Bologna universities, he became a lawyer. He entered political life in the 1930s, and was deputy for Saragossa during 1933-36. Minister of the interior under Gen. Franco, his later appointments included those of foreign minister during the crucial period of Spanish neutrality in the Second Great War, 1940-42. Member of the Falange national council from 1942, he was president of the political junta.

Serrano y Domínguez, FRANCISCO, DUKE DE LA TORRE (1810-85). Spanish soldier and statesman. Born at Arjonilla, Sept. 10, 1810, he entered the army, and became a general of division at the age of thirty. After the revolution of September, 1868, and the fall of Queen



Francisco Serrano y Domínguez, Spanish soldier

Isabella, Serrano was nominated commander-in-chief of the revolutionary army, and regent. When the Cortes decided in favour of a constitutional monarchy, Serrano became regent, and though he resigned these functions on the accession of Amadeus I of Savoy, he remained a minister. After the abdication of Amadeus in Feb., 1873, he was head of the provisional military government, and on the accession of Alphonso XII in 1874 left the country, but re-

turned in 1881. He died at Madrid, Nov. 26, 1885.

Sert, JOSÉ-MARIA (1876-1945). Spanish artist. Son of a celebrated textile designer, he was born in Barcelona, and studied in his father's workshops. He later went to Paris, where he became well known as a mural painter. Essentially a decorator, he executed wall paintings for Sir Philip Sassoon, and his work became fashionable in London during the 1920s. In Spain his most famous paintings consisted of seven large panels for Vich cathedral. This work occupied 20 years, and was destroyed in the Spanish Civil War. He later designed another set of huge groups of figures to adorn the restored cathedral. His style was derived from the Spanish Baroque and Rococo sculptors. Other murals included those for the conference room at League of Nations palace, Geneva, and for the Rockefeller Centre, New York. He died Nov. 27, 1945.

Sertorius, QUINTUS (d. 72 B.C.). Roman soldier. Born at Nursia in Sabine territory, he practised as a lawyer, and then entered the army. Having distinguished himself under Marius against the Cimbri, and in the Social war, he joined the democratic party of Marius and Cinna. After their death he removed to Spain and got together an army to oppose Sulla. By skillfully playing upon the superstitious feelings of the people, and by other measures, he made himself immensely popular. He made himself master of the greater part of the country, but, after fighting with varying success against Pompey and Caccilius Metellus, he was forced to abandon part of his conquests and to limit himself to maintain guerrilla warfare. He gradually lost the confidence of the natives, and, betrayed by his



Serval. Wild cat found in the forests and undergrowth throughout Africa

ally Perperna, was treacherously murdered at Osca (Huesca).

Sertularia. Genus of hydrozoan polyps. They occur in colonies fixed to marine shells and



Sertularia. Cells and portion of the stem of *S. perculata*, highly magnified

stones. They form horny, branched structures, often called sea firs.

Serum (Lat., whey). Pale yellow, watery, albuminous fluid left after removal of the clot formed in blood which has been allowed to stand. It contains thrombin (q.v.). See Blood.

Serum Therapy. Prevention or treatment of disease by an antitoxic serum. When a dose of bacteria or the toxins produced by bacteria is injected into an animal, the serum of the blood of that animal develops certain substances known as antitoxins, which neutralise the effect of the poisonous injection. After a succession of gradually increasing doses has been injected the animal is killed, and the serum prepared from its blood may be used for injection into a human being suffering from the disease, or may be given as a preventive dose. This method has been of great value in the treatment of diphtheria, tetanus, and many other diseases. See Antitoxin.

Serval (*Felis serval*). Species of wild cat. Occurring throughout Africa, it is about 4 ft. 6 ins. in total length; and the fur is a rich brownish yellow with black spots. The tail is banded and is a little over a foot long.

Servant (Lat. *servire*, to serve). In general, a person employed in working for another, whose orders he is bound to obey, provided that certain obligations, explicit or implicit, are observed by the master. The term is usually applied to those engaged in domestic service. The phrase, His Majesty's Servants, is commonly used of actors, from the fact that certain companies of players, especially in the 17th

century, were granted the right of describing themselves as "servants" of the king or queen. Members of the civil service are known generally as civil servants. The term servant is also commonly used in correspondence with a superior in rank, e.g. "Your humble servant." See Civil Service; Domestic Servant; Master.

Servetus, MICHAEL (1511-53). Spanish theologian. Born at Tudela, in 1531 he published a work



Michael Servetus,
Spanish theologian

on Errors Concerning the Trinity, which brought him into prominent notice. He then studied medicine at Lyons, and became physician to the archbishop of Vienne. Another work, published anonymously in 1553, led to his imprisonment at the instigation of Calvin; and on his escape to Geneva the same influence caused him to be rearrested and burnt, Oct. 27, 1553.

Service, ROBERT WILLIAM (b. 1874). Canadian poet and novelist. Born at Preston, Lancashire, Jan. 16, 1874, he led a varied and active life in Canada, and his poems, written much under the influence of Kipling, reflect the sterner aspects of life in the wild northwest. His



Robert W. Service,
Canadian poet

Songs of a Sourdough and Ballads of a Cheechako enjoyed a vogue; also his Rhymes of a Red Cross Man, prompted by his experiences in the Canadian Army Medical Corps during the First Great War. The Trail of '98 is a novel containing vivid pictures of life at Klondike. Later works include Ballads of a Bohemian, The Rough-Neck, Bar-room Ballads, Harper of Heaven, and his autobiography, Ploughman of the Moon, 1946.

Services, THE. Term used to define collectively the three British fighting forces, the Royal Navy, the Army, and the Royal Air Force (given here in order of seniority, the navy being often spoken of as the Senior Service). Servicemen are members of any of these services.

Service Tree (*Pyrus sorbus*). A tree of the family Rosaceae.



Service Tree. Leaves and clusters of greenish-brown berries

A native of Europe and temperate Asia, it is very similar to mountain ash, but the bark is rough, the leaflets broader and downy on both surfaces, the flowers larger, and the oval fruits four times the size of mountain-ash berries. The colour of the fruits also is different, being greenish brown with dots of rusty red. They are harsh to the taste until touched by frost.

Servile Wars. In ancient Roman history, name given to three slave revolts. The first Servile War, 135-132 B.C., began with a rising at Enna, in Sicily, led by Eunus, a Syrian wonder-worker, who defeated two consular armies, and overran the island. The capture of Enna and Tauromenium by Publius Rupilius ended the war.

A second revolt in Sicily, 103-99 B.C., ran a similar course. The leaders, or "kings," were a Syrian, Tryphon, and a Cilician, Athenio. After several years' hard fighting, the insurrection was suppressed by Manius Aquilius.

The third Servile War, also called the Gladiatorial War, 73-71 B.C., was a much greater danger than the others to the Roman power. Under Spartacus (*q.v.*), a vast horde of escaped gladiators and slaves ravaged Italy from the Alps to the Straits of Messina. In 72 they defeated both consuls, but the Celtic and German band, which seceded under Crixus, was destroyed at Mt. Garganus. The main body was blockaded in the Brutian peninsula, and, crossing into Lucania, was overthrown there by M. Licinius Crassus (*q.v.*).

Servites. Popular name of the R.C. mendicant order of the Religious Servants of the Holy Virgin. It was founded in 1233. The dress includes a black habit, leather

girdle, scapular, and cape. In 1487 Innocent VIII conferred upon the order privileges akin to those bestowed upon the Franciscans, Dominicans, Augustinian Hermits, and Carmolites.

Servitude (Lat. *servire*, to serve). State of slavery (*q.v.*) or slavish dependence. In Scots law, servitude is a burden affecting land and other heritable property. By it the owner is either restrained in the full use of his property, or is obliged to allow someone else to do certain acts upon it. Instances are the right of using a footpath, salmon fishing, and erecting something against a wall. The term is borrowed from Roman law. The English legal equivalent is easement (*q.v.*).

Servius Tullius. Sixth legendary king of ancient Rome, 578-534 B.C. The son of a slave of the royal household, he attracted the attention of Lucius Tarquinius Priscus, after whose murder he became king. He is the reputed founder of the so-called Servian constitution. Essentially military in character, this formed the basis of a new assembly, *comitia centuriata*, in which the power of wealth predominated. Servius also made an alliance with the Latins, brought the seven hills within the city limits, and surrounded the whole with a ditch and rampart, still known as the Servian Wall. See Comitia.

Sesame, GINGELLY, OILY GRAIN, OR GINGELI OIL-PLANT (*Sesamum indicum*). Annual herb of the family Pedaliaceae. A native of the Indian sub-continent, it has opposite, oval leaves, and white two-lipped flowers spotted with yellow, red, or purple. The small oily seeds are contained in oblong two-celled capsules. On pressure they yield a tasteless oil, which



Sesame. Leaves and flowers of the Indian plant

is used for the adulteration of oil of almonds. *Pron. sessa-me.*

Sesame and Lilies. Two lectures, Of Kings' Treasuries, and Of Queens' Gardens, by Ruskin, first published in 1865. They were addressed principally to young men and women, and dealt with the purposes of education; the Treasuries of the first lecture being true books and the Gardens of the second being the spheres of women's service.

Sesamoid Bone (Gr. *sēsamē*, sesame; *eidōs*, form). Small bone formed in the tendon of a muscle

which moves over a bony surface. The largest sesamoid bone in the body is the patella or kneecap.

Sesostris. Legendary Egyptian king. In Herodotus, Diodorus, and other Greek writers he is an heroic figure, whose empire extended from Libya to India, and from Nubia to Thrace. The deeds attributed to him are reminiscent of the achievements of Thothmes III, Seti I, and Rameses II.

Sessa Aurunca. City of Italy. It is in the prov. of Naples, 27 m. by rly. N.W. of Caserta. The cathedral dates from 1103. There are Roman remains in the city. Monte Massico, 2,660 ft., is a neighbouring limestone hill, anciently celebrated for its wines. Pop. 6,000.

Session (Lat. *sedere*, to sit). Word meaning a sitting and used in two main senses, political and legal. In the British parliament, and in those that have modelled their procedure thereon, e.g. the Canadian, a session is a continuous sitting of parliament, and usually takes up the greater part of a year. Each parliament consists of a certain number of sessions, each of which is opened by the king or someone representing him. A session is ended by a prorogation, but a parliament by a dissolution. A pause of a few days or weeks in the midst of a session is termed an adjournment. In law, the word is used for quarter and petty sessions. Each is a sitting of judges or magistrates. In the Presbyterian Church session is the name given to the meeting of the minister and elders. See **Parliament**; **Sessions**.

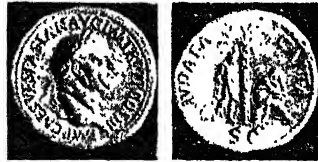
Session, COURT OF. In Scotland, the supreme civil tribunal, known also as the college of justice. In its present form, the court of session consists of thirteen judges, or senators of the college of justice; the inner house is divided into the first and second divisions, the former presided over by the lord president, the latter by the lord justice clerk, and each containing four judges; the outer house consists of five judges, lords ordinary, with coordinate powers of jurisdiction. The functions of the inner house are, with certain exceptions, those of an appeal court. Actions in the first instance come before judges of the outer house, and there are special courts, such as those of valuations and registration appeal. The court of session has no jurisdiction in criminal causes. It sits in Parliament House, Edinburgh. See **Scotland**.

Sessions. In law, term used for the sittings of justices in court upon commission. In England,

sessions of the peace is the general term for those sessions held by justices of the peace, which comprise petty sessions, where two or more justices sit to give summary trial for certain minor offences; special sessions, where justices transact such business as granting of licences, etc., for the county division, or borough which they represent; quarter sessions; and general sessions, where the justices meet to act judicially for the region covered by their commission.

In the U.S.A. courts of sessions, general sessions, and special sessions are local criminal courts for trial chiefly of minor offences. See **Brewster Sessions**; **Justice of the Peace**; **Quarter Sessions**.

Sesterce (Lat. *sestertius*, from *semis tertius*, two and a half). Ancient Roman coin at first equal to 2½ asses and subsequently to 4



Sesterce. Coin of Vespasian commemorating, on the reverse, the conquest of Judea. Diameter 1½ ins.

asses, or something over twopence in English money. Originally a small silver coin, it became a copper one under the Empire. Its symbol was IIS or HS. The *sestertium*, 1,000 *sestertii*, was the unit for reckoning large sums of money.

Sestina. Verse form invented by the French troubadour Arnaut Daniel, and used by the French troubadours of the 12th to the 14th centuries. It originally consisted of six stanzas of six unrhymed lines each—the same terminal words being used in each stanza, but in a different order—and a triplet. The form was frequently used by Dante and Petrarch. When English poets were experimenting with the old French verse forms in the latter part of the 19th century a number of them wrote rhymed sestinas. There are examples in A. C. Swinburne's *Poems and Ballads* (2nd series) and E. Gosse's *On Viol and Flute*.

Sestos. Chief town of the Thracian Chersonese, in ancient Greece. Situated on the Hellespont, opposite Abydos, it was in early times of considerable importance as affording a convenient passage from Europe to Asia. It is chiefly remembered as the place whence Xerxes (480 B.C.) transported his army to Europe over a

bridge of boats, and as the scene of the story of Hero and Leander. It was destroyed by the Athenian Chares in 353 B.C.

Sestri Levante. Town of Italy. It is on the coast of the Riviera di Levante, in the prov., and 28 m. by rly. E.S.E., of Genoa. It is both a winter and summer resort, and is beautifully situated. Pop. 3,600.

Sestri Ponente. Town of Italy. It is on the coast of the Riviera di Ponente, in the prov., and 4 m. by rly. W., of Genoa. It has ship-building yards, ironworks, tanneries, and saw-mills, and manufactures matches and macaroni. There are alabaster quarries in the neighbourhood. Pop. 26,000.

Set or Seth. Egyptian deity. Originally a predynastic tribal god at Kom Ombo, his traditional defeat by Horus may denote the victory of metal-using hawk-worshippers. Portrayed as a grotesque animal, perhaps the okapi, he came to represent the powers of darkness. He was rehabilitated in the XIXth dynasty, whose two monarchs Seti bore his name, and was ultimately identified with the Greek Tryphon.

Sète. French form of the Mediterranean town entered in this work under Cette.

Sete Quedas OR GUAYRA FALLS. Waterfall of S. America, situated on the river Paraná, in Brazil, just below its confluence with the Piquiry.

Seti. Name of two Egyptian kings of the XIXth dynasty. It is also spelled Sety, and in Greek Sethos. Seti I (c. 1300 B.C.) recorded at Karnak his Syrian, Hittite, and Libyan campaigns. His great Abydos temple and Theban tomb are supreme exam-



Seti I, the warrior king of the XIXth dynasty, as depicted in a relief in his temple at Abydos

ples of Egyptian art. Of his reign is a papyrus plan of Nubian gold mines, the oldest map known. His mummy is at Cairo. See Egypt; Sarcophagus.

Set-off. In English law, any debt due from the plaintiff to the defendant, which the defendant has a right to set off against the debt sued for. The Statute of Set-off (2 Geo. II, c. 22), which gave the defendant this right, confined it to a case of mutual debts of a definite sum. But now, in any action, the defendant may set up by way of set-off or counterclaim any claim that he has against the plaintiff.

Seton, ERNEST THOMPSON (1860-1946). Canadian author and artist. Born at South Shields, England, Aug. 14, 1860, descendant of the last earl of Winton, he was taken as a child to Canada. He lived in the Canadian backwoods, 1866-70, and was educated at Toronto; then returned to England to study in the R.A. school, London, 1879-81. Under the name of Ernest Seton-Thompson he established a reputation as a writer and illustrator of stories and books about wild nature, and received an official appointment as naturalist to the Manitoba government. His first book, *Wild Animals I*



E. Thompson Seton,
Canadian author

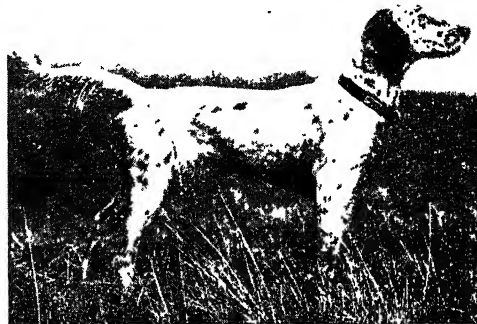
Have Known, 1898, was the first of many popular books of the same kind, e.g. *Wild Animals at Home*, 1913; *Wild Animals' Ways*, 1916. He was equally popular as a lecturer on these themes, and his *Art Anatomy of Animals* became a standard work. But he is chiefly remembered for his foundation of the Woodcraft League, a pioneer U.S. movement which in some ways anticipated the boy scouts. Seton died at Santa Fé, New Mexico, Oct. 23, 1946.

Settee. Long seat with a back and arms. It is a variant of the settle, and was first associated with the Directoire and Chippendale styles. A settee and two matching arm chairs form the standard three-piece suite. The word is also used for a sailing vessel with a long sharp prow and a single deck.

Settembrini, LUIGI (1813-77). Italian author and patriot. He was born at Naples, April 17, 1813, and became professor at Catanzaro at the age of 22. His liberal and patriotic views brought him into con-

flict with the authorities, and from 1839 he was either in prison or in exile until 1860, when he returned to Italy and was appointed professor of literature at Naples university. He died Nov. 3, 1877. His *Lezioni della Letteratura Italiana*, of which there have been many editions, is on the whole the best Italian literary history.

Setter. Large breed of dogs of the spaniel group. They are game dogs and are trained to crouch



Setter. A champion of the English breed

down when marking game, instead of standing like the pointer.

Five breeds of setter are recognized, though only three of them are generally met with. The English breed, which contains a good deal of pointer blood, is a handsome animal with a wavy silky coat, while the tail carries a fringe of long, straight hair, and the toes have hair on the inner sides.

The Scottish or Gordon setter is the heaviest breed, and has been crossed with the bloodhound. It is black and tan in colour, has coarse hair and a rather short tail. The Irish setter is a smaller and much lighter breed, has red hair, and is an untiring companion for the sportsman. The Russian setter has an extraordinarily woolly coat, densely matted together, which almost conceals its form.

Setters require careful training, as they are apt to run wild in their excitement; but well-bred dogs are usually broken to game without much difficulty. See Dogs colour plate; Pointer.

Setterwort (*Helleborus foetidus*). Perennial herb of the family Ranunculaceae. It is a native of W. Europe, and, as a rare wild plant, of the S. and E. of England in chalky soil. It varies in height from a foot to 2 ft., with large, leathery leaves 6 ins. across.

The large flowers, which open about Feb., are conspicuous from their pale greenish-yellow sepals,

the petals being converted into little green tubes containing nectar. After the flower has been slightly open for a few days, a line of dull crimson develops on the margins of the sepals. The seed-vessels are large follicles, of which two or three are produced by each flower, and contain about twelve large black wrinkled seeds. It has a strong fetid odour. Formerly, it was much used in domestic medicine, the dried leaves being powdered and administered as a vermifuge. Another name for the flower is stinking hellebore. See Hellebore.

Settle. Market town and rural district of Yorkshire (W.R.), England. It stands on the left bank of the river Ribbles, 16 m. from Skipton, and is served by rly. The buildings include the parish church

and town hall. Folly Hall is a 17th-century building, and there are cotton mills and tan yards. The town is a good centre for tourists to the neighbouring Pennine Hills with their caves. Across the Ribbles is Giggleswick (g.v.) School. Market day, Tues. Pop. 2,455.

Settled Land Acts. Acts of the British parliament by which land can be freely dealt with even though it is settled on various persons in succession none of whom would, but for the Acts, be entitled to dispose of the land. The Settled Land Act, 1925, vests the legal estate in the land in the person entitled to its present enjoyment, i.e. the tenant for life. He holds this legal estate on trust to give effect to his own interest and to the interests of those who will be entitled to the possession of the land after him. He has therefore large powers of selling and otherwise dealing with the land. Before he can exercise these powers two trustees must be appointed whose duty it is to receive any money paid, e.g. in sale, and retain it as capital, investing it in trustee securities. The income will be paid to the tenant for life and the capital will pass under the settlement in the same way as the land that has been sold.

Settlement. Act of settling or placing a person or thing. Apart from its special legal senses (v.i.), the word is used for the planting of

a colony, for the establishment of anyone in a fixed place or position, and for the payment of a debt.

In another sense settlement is the gradual sinking of a building or some part of it. It may be of no consequence, or it may be so serious as to lead to collapse, unless immediately remedied. There are three kinds of settlement: (1) settlement of mortar joints in brickwork and masonry, which occurs as courses are added before the mortar in the bed joints below has set; this is of no consequence provided the walls are not built too quickly, and that settlement is equalised by building at an even rate all round the walls; (2) equal settlement due to even compression of the foundation subsoil under the weight of the building; this varies, but is normally a small fraction of an in., and is of no consequence unless excessive; (3) unequal settlement, usually due to local weakness of subsoil, or inadequate foundations under points where heavy loads are concentrated, as under beams and columns.

Unequal settlement causes walls to crack vertically, may lead to bulging, leaning, or even collapse of walls which may affect floors and roofs depending upon the walls for support. In framed buildings unequal settlement causes distortion, though collapse is not so likely. The remedy is to underpin the walls and columns and to strengthen the foundations, either by taking them to stronger subsoil at a greater depth or by increasing the bearing area of the foundation by widening it. For all but small buildings this work is costly. Where unequal settlement is slight and does not increase it is sufficient to repair the cracks.

Settlement. In English law, the tying up of property with the object of providing for members of the settlor's family, and also of preserving a property intact. Such a settlement can be made either by deed or by will. Suppose that A, a man of wealth, is about to marry. He will make a settlement, making himself tenant for life, which will give him full enjoyment of the property and also enable him to dispose of the property under the Settled Land Acts (*v.s.*). Next will follow: (1) a provision for an income for his proposed wife during her widowhood; (2) a provision for the enjoyment of the property to pass on A's death to the eldest of the sons born of the marriage.

The law was opposed to the tying up of property for a very long

period, and settlements are of no effect if they attempt to tie up the property for longer than the life of persons living when the settlement is made and 21 years thereafter. Thus a settlement is usually valid only until the eldest son of the marriage becomes 21. The eldest son, when he becomes 21, usually joins with his father in resettling the property.

Settlement, ACT OF. Measure passed by the parliament of England in June, 1701. It settled the crown of the country, and with it those of Scotland and Ireland, on the electress Sophia of Hanover and her heirs. There was little prospect of the reigning king, William III, or his heir presumptive, Anne, leaving a child who could succeed to the throne, and the dominant party in the land was determined that the Stuarts should not return. Sophia, widow of the elector of Hanover, was a granddaughter of James I, and, most important of all, she was a Protestant. The Act therefore said that, failing issue to William or Anne, the crown should pass to Sophia and the heirs of her body being Protestants. It bound Ireland, and Scotland accepted it by the Act of Union which came into force in 1707.

The Act contained eight clauses apart from those settling the succession. One declared that all future sovereigns must belong to the Church of England, and another that the country should not be compelled to engage in war for the defence of lands not belonging to the crown of England unless with the consent of parliament: this was a censure on William's wars in defence of the United Provinces. It provided that judges should not be removed from their offices, except at the request of both houses of parliament, and it prevented the sovereign from putting a stop to an impeachment. Other clauses, afterwards repealed, forbade the sovereign to leave England, Scotland, or Ireland without the consent of parliament; ordered all resolutions of the privy council to be signed by the members assenting thereto. The full text of the Act is printed at the end of Stubbs's *Select Charters*. Passed by a majority of one vote in the house of commons, it received the royal assent, June 12, 1701. By His Majesty's Declaration of Abdicacion Act, 1836, under which Edward VIII abdicated the throne, it was provided that the Act of Settlement should be construed so as to exclude from the

succession the issue, and descendants of the issue, of Edward VIII. The right of George VI and his heirs to the British throne arises from the Act of Settlement, 1701, and the Abdicacion Act, 1936.

Settlement. In English poor law, the legal right, acquired by residence or otherwise, of a pauper to maintenance in a particular union or parish. The duty laid on every parish by the 43rd Elizabeth to maintain its own poor was followed in 1662 by a statute enacting that settlement could be acquired by 40 days' undisturbed residence in a parish, but providing that any new inhabitant within 40 days of his arrival might be removed to the parish where he was last legally settled by birth, residence, or apprenticeship, unless he either rented a tenement of £10 a year, or could give adequate security. This led to certain abuses, and subsequent legislation made it almost impossible for the poor to acquire settlement, and thus avoid removal. In 1795, however, some redress of their grievances was given by the declaration that henceforth no poor persons should be liable to removal until they actually became chargeable to the parish. Settlement ceased to be relevant with the passing of the National Assistance Act, 1948. See *Pauperism*; *Poor Law*.

Settlement, SOCIAL. Name applied to various societies of social workers established in the poor quarters of great cities. Their aim is to study the problems affecting the life of the labouring classes on the spot, by daily intercourse with them, and thereby to promote their education, culture, and in many cases their religious life. The movement originated in the second half of the 19th century, especially in connexion with the work carried on in Whitechapel by S. A. Barnett and A. Toynbee, continued after the latter's death at Toynbee Hall (*q.v.*). Most social settlements organize social clubs, classes, lectures, concerts, etc., and afford temporary quarters for persons who wish to study and help in the work. University settlements, like Oxford House (*q.v.*) and Toynbee Hall, form one class; others are conducted by colleges and public schools, like the one maintained by Caius College, Cambridge, at Battersea, and Eton College Mission at Hackney Wick; and by religious bodies, like the Woodbrooke Settlement, Birmingham, and the Robert Browning Settlement, Walworth Road, London.

Setúbal. Dist. and town of Portugal. The district has an area of 1,970 sq. m. and a pop. of 268,884. The town lies on the Bay of Setúbal, on the river Sado, 20 m. S.E. of Lisbon, and is served by rly. An important seaport and an important centre of the sardine fishery, its exports include salt, of which there are rich deposits, sardines, fruit, local white wines, cork; its imports coal and tin. Christ Church is a notable 15th century foundation, and the harbour has two main forts. On the other side of the bay are situated the ancient remains known as Troia, possibly the Roman Cetobriga. St. Yves is the French, St. Ubes the English name for the town. Pop. 47,000.

Setúbal, BAY OF. A wide opening on the coast of Portugal, it lies S. of Lisbon between Capes Espichel and de Sines. It receives the river Sado and at its head is the port of Setúbal.

Seurat, GEORGES PIERRE (1859-91). French painter. Born in Paris, Dec. 2, 1859, he studied under Henri Lehmann. His painting, *La Baignade*, refused by the Salon in 1884, was exhibited the same year at the Salon des Indépendants, which he helped to found; it was later acquired by the Tate Gallery. He joined the Impressionists and painted his later pictures in the style called pointillism (*q.v.*), of which he was a pioneer. Two of his best known



Sevastopol, Crimea. The Middle Harbour of this historic port

as Goktcha (*q.v.*). There is also an island of Sevang on which is an Armenian monastery.

Sevastopol. Town and fortress of the R.S.F.S.R., in Crimea region. It stands on the S.W. coast of the Crimea, and is a rly. terminus. The harbour, the ancient Ktenus Portus, is one of the best in Russia, capable of accommodating ships of very large tonnage. The town, including the port and the naval dockyard, was virtually destroyed in the Second Great War (*v.i.*). Its chief industries were shipbuilding and the making of wine. Sevastopol, near the site of the old Greek colony Kheronesus-Heraclaea (Kheroneses Pt.)

SECOND GREAT WAR. Sevastopol was first bombed by the Germans on June 22, 1941, the day they invaded Russian-held territory. By the beginning of Nov. the Germans were in the Crimea, and by Nov. 11 had invested the town. The Russians repelled repeated German attempts to storm Sevastopol, and made counter-attacks supported by aircraft and the guns of the Black Sea fleet, submarines of which kept the town supplied with food and ammunition during the ensuing siege. On June 5, 1942, the Germans opened a new violent attack with infantry, massed artillery, tanks, and waves of dive-bombers. By June 24 most of the civilian population, which had remained in the town through the siege, had been evacuated by sea, and the garrison had withdrawn within the inner defences. The Germans broke into the town on July 2, its evacuation being admitted by the Russians on July 3.

By their recapture of Melitopol on Oct. 23, 1943, the Russians isolated Axis forces in the Crimea, attacking them early in the following April. As one point after another in the Crimea fell to the Russians, the Germans and Rumanians retired behind three lines of prepared defences into Sevastopol, their attempts to escape from which by sea were frustrated by the Russian air force and the Black Sea fleet. Shelling with long-range Russian artillery began on April 15, 1944; bitter local engagements culminated in a three days' assault at the end of which, on May 9, the 4th Ukrainian army took the town by storm, the elaborate German defences having been shattered by artillery and aerial bombardment.



Georges Seurat. *La Baignade*, his first exhibited picture, now in the Tate Gallery, London

works are *Un Dimanche à la Grande Jatte*, 1886, now in the U.S.A., and *La Cirque*, 1891, in the Luxembourg. He died in Paris, March 29, 1891.

Sevang. Alternative name for the lake of Armenia better known

as Goktcha (*q.v.*). There is also an island of Sevang on which is an Armenian monastery. The siege of 1854-55 is described in a separate entry (*v.i.*). The Bolsheviks captured Sevastopol in Nov., 1920. Pop. (1939) 111,946.

Sevastopol, SIEGE OF. Principal incident in the Crimean War, 1854-55. The Allies' main attack on Russia was made in the Black Sea and centred on the capture of the fortress of Sevastopol, which commanded the harbour where lay the principal forces of the Russian fleet. After Alma, Sept. 20, 1854, the Allied armies were able to entrench themselves within a mile of Sevastopol, and on Oct. 17 began to bombard it.

Meanwhile the harbour had been successfully blocked by sunken vessels and booms. Little change took place so far as Sevastopol was concerned until June 7, 1855, although in the interval had occurred the battles of Balaklava and Inkerman. On June 7 the French carried the Mamelon fortress which protected the Malakoff works, Sevastopol's chief defence. The British attempt on the Redan, ten days later, failed. A furious bombardment was opened by the Allies early in Aug., and the French victory of the Tchernaya, Aug. 16, was the finishing stroke to the Russians. After a final assault, Sept. 5, Sevastopol was evacuated and the Russians retreated, leaving their wounded behind them. *See* Alma; Crimean War; Redan.

Seven (Skt. *saptan*; Gr. *hepta*; Lat. *septem*). Sacred number among many nations of the East. Called sometimes the number of perfection, it and its multiples are of frequent occurrence in the Bible. For examples, on the 7th day God ended His work (Gen. 2); clean beasts were taken into the ark by sevens (Gen. 7); the feasts of the Passover, Weeks, and Tabernacles lasted 7 days (Ex. 12; 34; Deut. 16); Pentecost was 7 weeks after the Passover (Lev. 23); each 7th year was a sabbatical year (Lev. 25); the jubilee year was the year after 7 times 7 years (Lev. 25); the Day of Atonement fell in the 7th month (Lev. 26). In the N.T. are notable the 7 words from the Cross, the choosing of 7 deacons by the church (Acts 6), the whole imagery of the Book of Revelation, and the enumeration of the 7 Churches of Asia (*q.v.*). In both O.T. and N.T., however, the number, the application of which in ecclesiastical art is noteworthy, was used sometimes simply to express a sufficiency or the equivalent of a large number, as it was by Shakespeare, who also referred to the seven ages of man.

Buddhist philosophy refers to man as representing the 7-stringed world-lyre; Chinese philosophy gives man 7 material souls; Japan

has its 7 gods of happiness or luck. The 7 senses are animation, feeling, speech, taste, sight, hearing, and smelling. The 7 virtues are faith, hope, charity, prudence, justice, fortitude, and temperance; or humility, chastity, love, patience, bounty, abstinence, and vigilance. The 7 deadly sins are pride, wrath, envy, lust, gluttony, avarice, and sloth.

Seven Bishops. Those who in 1688 petitioned James II against his order commanding the clergy to read on two successive Sundays his second Declaration of Indulgence. The seven were William Sancroft, archbishop of Canterbury; Thomas Ken, bishop of Bath and Wells; Sir Jonathan Trelawny, Bart., bishop of Bristol; Lloyd of St. Asaph; Lake of Chichester; White of Peterborough; and Turner of Ely. In temperate language they declared that the Declaration was illegal, and asked to be excused from reading it. The petition was printed, and the king had the bishops arrested for seditious libel. Tried before three judges, they were found not guilty by the jury.

Seven Champions of Christendom. Name given in medieval legend to the patron saints of seven countries. Their deeds were celebrated in prose and verse, the best prose version being that of Richard Johnson (1573-1659), entitled *Famous Historie of the Seaven Champions of Christendom*, 1596-1610. The champions were: S. George of England, S. Denis of France, S. Anthony of Italy, S. James of Spain, S. Andrew of Scotland, S. Patrick of Ireland, and S. David of Wales.

Seven Churches of Asia. Name given to the seven principal churches in Asia Minor which were presided over by bishops in apostolic days. They are enumerated in the opening chapters of the Book of Revelation, where special messages and warnings are sent to them. They were Ephesus, Smyrna, Pergamos, Thyatira, Sardis, Philadelphia, and Laodicea. *See* Revelation, Book of.

Seven Days' Battle. Series of engagements in the American Civil War, June 26-July 2, 1862. After their repulse by the Federal army at the battle

of Fair Oaks (*q.v.*), the Confederates made a vigorous attack. The first engagement, June 26, failed.

The next day Lee attacked again, and forced the Federals across the river, losing heavily, but taking over 5,000 prisoners. During the 28th McClellan retreated south, and on the following day Lee sent six divisions under Jackson and Longstreet in pursuit. Indecisive fighting took place until July 1, when the two main armies engaged at Malvern Hill on the N. bank of the James river. The battle gave no definite advantage to either side, but the Federal campaign of invasion was definitely balked, and the moral advantage lay with the Confederates. *See* American Civil War.

Seven Dials. Area in London where seven narrow streets meet. It is between St. Martin's Lane and New Oxford Street, W.C. A column bearing a sundial, which stood in the centre of the open space, was removed in 1773 during a quest for a supposed buried treasure, and was set up on Weybridge Green, Surrey, 1822. Once noted for its broadsheet ballad printers and ballad-mongers, Seven Dials later became a centre for dealers in domestic pets.

Seven Islands. Bay of Quebec, Canada. An opening on the N. side of the Gulf of St. Lawrence, it is about nine by six miles in extent, and is protected by seven islands, which have been celebrated in a ballad by Whittier. It is an excellent harbour, with three distinct channels for navigation.

Sevenoaks. Urban dist. and market town of Kent, England, 22 m. by rly. S.E. of London. It gives its name to a co. constituency. Picturesquely situated on the Darent, it allegedly derives its name from seven oaks standing on the Tonbridge road. The chief building is the church of S. Nicholas, dating in part from the 13th



Sevenoaks, Kent. Parish church of S. Nicholas
F. 114



Sevenoaks arms
ground in England. Adjoining the town to the S. are Knole (*q.v.*) house and park. Market day, Mon. Pop. 14,550.

Seven Pillars of Wisdom, THE. Book by T. E. Lawrence (*q.v.*). Of immense length, it is primarily an account of Lawrence's campaign undertaken in the First Great War to rouse the Arab tribesmen in the Middle East against their Turkish rulers; against this background it is a brilliant exhibition of erudition, philosophy, and human drama. The book was first printed on the author's private press in 1923, when about 90 copies were issued, at a price variously stated at 23, 25, and 90 guineas. Lawrence intended the book to be published only after his death, but in the autumn of 1927 an abridged edition, *Revolt in the Desert*, was enthusiastically welcomed by the public. Lawrence's death in 1935 released the ban on the original version, which was published that year, and sold 200,000 copies. The work takes its name from a poem of dedication "to S.A." in which Lawrence writes:

... to earn you freedom,
The seven-pillared worthy house ...

Seven Sisters, THE. Name given to a line of chalk sea cliffs, forming the edge of a spur of the South Downs, stretching S.E. from Cuckmere Haven, Sussex, to Birling Gap, near Beachy Head. The



The Seven Sisters. A striking line of chalk cliffs forming part of the Sussex coast, near Seaford

undulations of the cliff top form the white face of the cliff into seven peaks. Most of the downland here was vested in the National Trust in 1930-31.

Seven Sleepers. Seven Christians of Ephesus who, according to the Eastern European legend, took refuge in a cave during the persecution of the Roman Emperor Decius.

249-251, and being walled into the cave by their pursuers, fell into a trance which lasted 200 years. On awaking in the reign of Theodosius II (408-450), they convinced him of a life after death, and then fell into another trance destined to last till the Resurrection.

Seventh. Musical interval one degree smaller than an octave. It is of three kinds:



A chord of the seventh consists of a 7th from the root added to a triad. There are three categories: (a) fundamental, *e.g.* the dominant seventh; (b) secondary, *i.e.* other than (a) but diatonic; and (c) diminished, which always includes one or more chromatic notes. This is really the first inversion of a minor ninth chord, and, owing to the possibility of enharmonically changing the notation of any of its notes, with a consequent fresh resolution, it affords an easy method of effecting any modulation, no matter how extraneous. The normal resolution is upon a chord the root of which is a fourth higher, thus:



Provided, however, that the dissonant note, the 7th, either falls a degree, or rises a semitone, or remains to be a note in the next chord, any other resolution is possible.

Seventh Day Baptists. Protestant sect which originated with the Traskites or Sabbatarians of

the 17th century. They profess the usual principles of Baptists, but observe the Jewish Sabbath. They were established in the U.S.A. about 1681. See Adventists.

Seven Weeks' War. Name given to the war between Prussia and the allied powers of Austria and certain German states, 1866. The long-standing enmity between

Austria and Prussia had caused the latter power to reorganize her army and place herself on a powerful footing. When Austria referred the Schleswig-Holstein question to the Germanic diet, Bismarck outlined the Prussian scheme of hegemony, purposely irritating Austria to the extent of making her demand the exclusion of Prussia from the diet. With Austria stood Bavaria, Württemberg, Baden, Saxony, Hesse-Cassel, Hanover, and Nassau. Strengthened by the secret alliance of Italy, April 8, Prussia declared war, June 14, and invaded Saxony and Bohemia.

The Austrians, who had anticipated an attack from Silesia, had concentrated their forces near the Riesengebirge, and the Prussians met with little opposition. After several minor successes the Prussians, under William I, encountered the main Austrian army at Königgrätz or Sadowa (*q.v.*) and defeated them decisively on July 3. The Austrians asked for a truce, but the Prussians pushed on to Vienna, which they would have taken had not the truce of Nikolsburg been declared, July 26. Meanwhile the Italians, who had entered the war for the purpose of recovering Venetia, had advanced across the Mincio, but were defeated at Custoza, June 24.

This catastrophe did not affect the success of Italy's purpose, for after Sadowa the Austrians ceded Venetia to Napoleon III, who handed it over to Italy. Italy's part in the war was not limited to her defeat at Custoza, for on July 20 her fleet, under Persano, was utterly routed by Tegethoff at the battle of Lissa (*q.v.*). The part played by the allied German states was insignificant; the Hanoverians were defeated at Langensalza, June 28, by Prussia, who successfully quashed the offensives of all the smaller states. The armistice of Nikolsburg was succeeded by the peace of Prague, signed Aug. 23. By this Austria withdrew from the Bund, ceded Venetia, and renounced her claims in Schleswig-Holstein, which, with Hanover, Hesse-Cassel, Nassau, and Frankfurt-on-Main, were soon annexed by Prussia.

Seven Wise Masters, THE. Old collection of Oriental stories, of which Hebrew, Persian, Syriac, and Latin versions have been recorded. The stories are connected with the fate of a king's son, whose life is in danger if he does not refrain from speaking for seven days. His fate is kept continually in the balance, for his stepmother

tells a fresh tale each day to justify his instant execution, while the seven wise masters, or viziers, successively win a day's respite for him by another tale, until the seven days are past and the lad can speak and reveal the truth about his wicked stepmother. The oldest English version, printed in the mid-16th century, is included in *Early English Metrical Romances*. G. Ellis, 1805.

Seven Wise Men. These were Solon of Athens, Thales of Miletus, Bias of Priēne, Chilon of Sparta, Pittacus of Mitylēnē, Periander of Corinth, and Cleobolus of Lindus. Many wise sayings were attributed to them, the most notable being Solon's "Do nothing in excess" and Chilon's "Know thyself."

Seven Wonders of the World. In ancient times, the Hanging Gardens of Babylon, the Pyramids of Egypt, the temple of Diana at Ephesus, the statue of Jupiter by Pheidias at Athens, the Colossus of Rhodes, the mausoleum erected by Artemisia at Halicarnassus, and the Pharos or lighthouse of Alexandria. An extant description of these wonders is attributed to the mechanician Philo of Byzantium (c. 145 B.C.).

Seven Years' War, THE (1756-63). Struggle between, on one side, Great Britain, Prussia, and Hanover, and on the other, France, Austria, Russia, Sweden, Saxony, and finally Spain. It had two main aspects. In one it was a duel between France and Great Britain for the overseas empire in America and in India; in the other it was the struggle of Prussia against foes encircling her on every side.

The first blow was struck with the attack upon Minorca, its capture by the French in 1756 initiating the naval contest. The other powers remained at peace. But in the autumn Frederick, satisfied that Austria was waiting only to complete her preparations before launching against him her own armies and those of her allies, struck before his enemies were ready, and attacked Saxony. That state, however, offered a sufficiently firm resistance to compel him to postpone the invasion of Bohemia which was his objective.

The war in India had two phases, the conquest of Bengal, which was only indirectly connected with the French quarrel, and the destruction of the French power in the S. of India consequent upon the inability of France to dispatch adequate military or naval assistance. The decisive incidents were the battle of Plassey (*q.v.*), June

23, 1757, and the overthrow of the French at Wandewash, Jan. 22, 1760. In America partially successful campaigns in 1753 were followed by the siege and capture of Quebec by General Wolfe (*q.v.*) in 1759, whereby the complete conquest of Canada in the next year was ensured. The British fleet, after initial mismanagement, soon asserted an ascendancy which generally paralysed the French and was converted into an overwhelming supremacy by the virtual annihilation of the French fighting fleet in Hawke's (*q.v.*) great victory at Quiberon, Nov. 20, 1759. After that the British fleet could go where it would. The French colonial possessions lay at its mercy, and those of the Spaniards also when they entered the war in 1761.

In the actual war on the Continent Great Britain, under the guidance of the elder Pitt, played only a secondary part, *i.e.* she supplied Frederick with troops which were efficient but few, and money, without which it would have been impossible for him to maintain the struggle. Also, by engaging France in the colonial war, and by the perpetual threat and the occasional practice of descents upon the French coast, she diverted French energies from concentrating in full force upon the war against Frederick—just as that war prevented France from concentrating her energies on what was, to her, of infinitely more importance, the duel with Great Britain.

Thus the Prussian kingdom had to fight for its life almost single-handed. On the N.W. it was guarded by the forces of its N. German and British allies, under the command first of the duke of Cumberland, and then of Ferdinand of Brunswick, a most efficient general. In 1757 Frederick invaded Bohemia, won the battle of Prague, and was driven out again by his defeat at Kolin (*q.v.*). Later he was always on the defensive, threatened by the French on the S.W., the Austrians on the S., and the Russians on the E., each having an army larger than any force he could muster. Yet he broke up the French army at Rossbach, Nov. 5, and an Austrian army at Leuthen, Dec. 5.

In 1758 he drove off the Russians by a victory at Zorndorf, but suffered defeat from the Austrians at Hochkirch. In 1759 Ferdinand won a brilliant victory over the French at Minden, but Frederick suffered a crushing defeat from the Russians at Kunersdorf. In 1760 he twice defeated the Aus-

trians, at Liegnitz and Torgau. But his victories were no longer crushing blows; his exhaustion was too great. He was in fact saved by the incapacity of the Austrians, and the disinclination of the Russians to follow up any victory. In 1761 the French were practically out of action, and Russia withdrew from the war; so that in what remained of the duel with Austria Frederick was still just able to hold his own. The war was brought to an end at the beginning of 1763, by the treaties of Paris and Hubertusburg, which gave Canada to Great Britain, left the French without an effective foothold in India, and preserved to Frederick his territories intact as they were before the war. See Chatham, 1st Earl of; Clive, Lord; Frederick the Great; Wolfe.

Severn. River of England and Wales. It rises in Wales, on the E. side of Plynlimmon, in the S.W. of Montgomeryshire, and flows in a great curve to its estuary, an inland continuation of the Bristol Channel. The estuary, the lower course of the river itself as far as Tewkesbury, and the Stratford or Warwickshire Avon, the chief left-bank tributary of the Severn, form a valley containing three lowland sections, the Vale of Berkeley, the Vale of Gloucester, and the Vale of Evesham, and receives no streams of any size from the S.E. scarp of the Cotswolds. The Bristol Avon flows in a gorge round the S.W. end.

In a striking contrast the rivers which flow into this valley from the N.W. are numerous and long, and drain the major portion of the Cambrian uplands. The Taff, Usk, Wye, and Leadon are right-bank affluents of the Severn. In its middle course the Severn receives the Teme from Kerry Hill, Montgomeryshire, and the Stour from the N. end of the Lickey Hills. On its banks are Shrewsbury, Welshpool, Newtown, and Llanidloes.

The Severn is a rapid river. Below Gloucester, especially near Newnham, the tide, coming up with great velocity, may, owing to the configuration of the estuary, reverse the flow as high up the river as Towkesbury lock, 13½ m. above Gloucester. Twice a year, in early March and early Sept., this produces a wave or bore, locally called hygro, which is sometimes 5 or 6 ft. high and strong enough to overwhelm lighters using the river. Severn is of little use for navigation except in the deeper reaches. In the upper course the Shropshire Union canal is parallel with the

river for many miles. At Stourport it connects with the Staffordshire and Worcester canals, and at Worcester with the Worcester and Birmingham canal. The Avon connects with the Stratford-on-Avon canal at Stratford. By the Bristol Avon there is canal connexion with the Thames.

At Sharpness the Severn bridge, 4,162 ft. in length, carries the rly. across the estuary by 22 spans, and by a swing bridge, 200 ft. long, over the Gloucester and Berkeley ship canal. In 1947 the ministry of Transport authorised the construction of a road bridge between Beachley and Aust, to be the longest suspension bridge in Europe, with a centre span of 3,000 ft., two side spans of 1,000 ft. each, and a total length, including the approach roads on both sides of the estuary, of 8 m. Near New Passage a tunnel, 4½ m. long, shortens the rly. journey from Bristol to Cardiff.

SEVERN BARRAGE. A committee presided over by Lord Brabazon proposed in 1933 the construction of a barrage at the English Stones reef, between Glos and Mon, for the production of hydro-electric power from the tide in the Severn. Ten years later a panel of engineers was set up by the ministry of Fuel and Power and reported in March, 1945, that from an engineering point of view the scheme was practicable; the barrage would take eight years to build and would cost £47 m.; the average annual output of energy would be 2,190 m. kWh.; and the saving in coal during the first 15 years would be 985,000 tons.

Severn, JOSEPH (1793-1879). British painter. Born at Hoxton, Dec. 7, 1793, he studied at the R.A. schools, and won the gold medal in 1818. An intimate friend of Keats (*q.v.*), whose portrait he several times painted, he accompanied the poet to Italy in 1820, and was present at his death in 1821. Severn lived principally in Rome, where he painted historical subjects. He acted as consul at Rome during 1860-72, and died there, Aug. 3, 1879, being buried beside Keats. *Consult* Against Oblivion, Lady Birkenhead, 1943.

Severus, ALEXANDER. Roman emperor. from A.D. 222 to 235. *See* Alexander Severus.

Severus, LUCIUS SEPTIMIUS (146-211). Roman emperor, 193-211. Born near Leptis Magna, Africa, he was in command of the legions in Pannonia when the emperor Pertinax was murdered,

and was by them proclaimed emperor. Didius (*q.v.*) was murdered just before Severus entered Rome, and Pescennius



Septimius Severus,
Roman emperor
From a bust

Niger, proclaimed emperor by the Eastern armies, was disposed of after two battles in 194. Yet another claimant, Clodius Albinus, was defeated by Severus near Lyons in 197. Disquieting news from the East now caused Severus to turn his attention to the Parthians, and in the course of an expedition against them he took Babylon, Seleucia, and Ctesiphon, the Parthian capital. His eastern victories are celebrated on the well-known arch at Rome which bears his name. The closing years of his reign were occupied with campaigns in Britain from 208. He is said to have rebuilt the wall between the Forth and the Clyde which bears his name. Severus died at York, Feb. 4, 211. *See* Rome.

Sévigé, MARIE, MARQUISE DE (1626-96). French writer. Born in Paris, Feb. 5, 1626, Marie de Rabutin-Chantal lost both parents at an early age, and was well educated by her uncle the Abbé de Coulanges. In 1644 she married the marquis Henri de Sévigé, who was mortally wounded in a duel in 1651. She then settled in Paris, where she educated her children, and died at Corignan, Feb. 17, 1696. A woman of great charm and brilliant gifts, she retained her goodness of heart and character unsullied by the corrupt society in which she was a conspicuous figure. In spite of her intellect Mme. de Sévigé did not, like so many *précieuses*, seek literary fame; but the letters which for some 25 years she wrote to her daughter, the comtesse de Grignan, and her many friends, who included Turpin and Conti, are an enduring monument to the genius of one whom the French regard as unsurpassed in the epistolary art.

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G. Bossier, 1888; A. Tilley, 1938; *Portraits de Femmes*, C. A. Sainte-Beuve, 1856; *Études*, E. Scherer, 1863-74; *Queen of Letter Writers*, J. Aldis, 1907; *Mme. de S. her Letters and her World*, A. Stanley, 1946.

Seville. Inland prov. of S.W. Spain, in Andalusia. It lies between the Sierra Morena and the Sierra de Ronda, and is a lowland drained by the Guadalquivir, the Genil, and smaller streams. Coal, iron, copper, and marble are the chief minerals. Seville has been celebrated for its wool, silk, wine, and oil since Phoenician times. Its area is 5,428 sq. m. Pop. 1,081,000.

Seville. Fourth city of Spain, in Andalusia. It stands on the left bank of the Guadalquivir, 54 m. from the Atlantic and 12 m. below the end of the tidal reach of the river, which has been canalised and dredged as far as the city. Much of the city lies below high-water level, and is liable to floods; the river front is a wide open embankment, and three bridges make connexion with the suburb of Triana on the right bank.



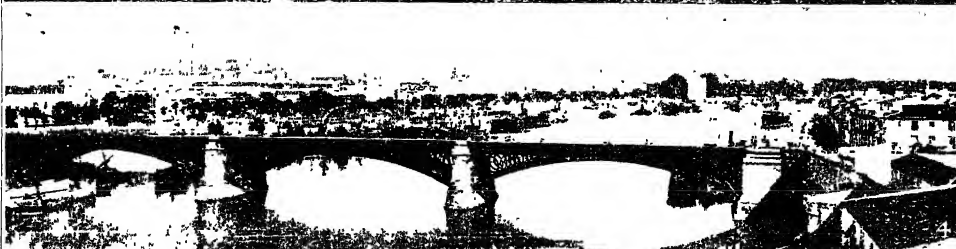
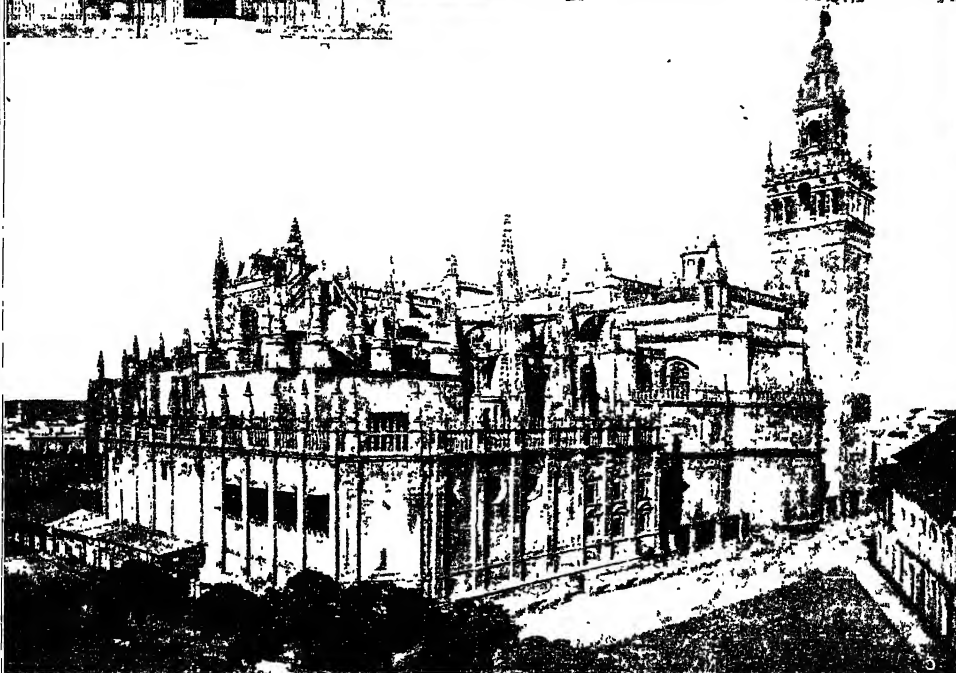
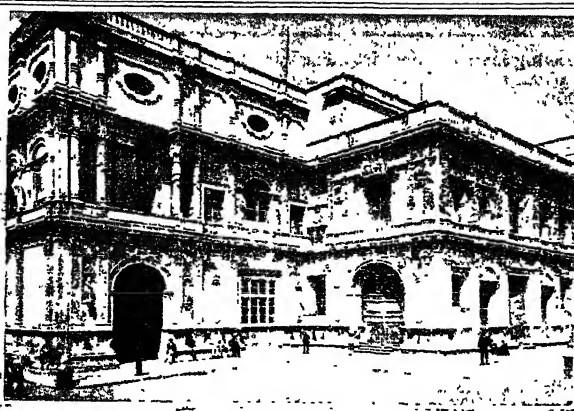
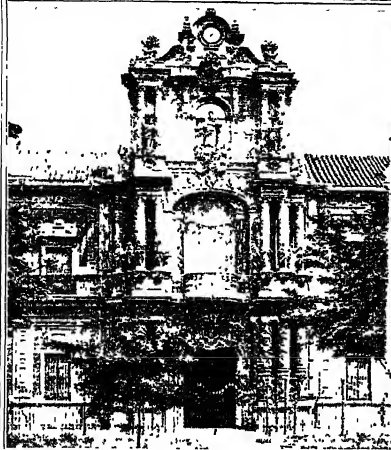
Seville arms

More characteristically Moorish in its architecture than any other Spanish city, the older portions are of surpassing interest. On the Plaza del Triunfo stand the cathedral, the Alcázar, and the exchange; on the Plaza de San Fernando, the city hall. The minster, 1403-1519, one of the finest Gothic edifices in the world, occupies part of the site of a Moorish mosque, the Court of Oranges being another portion. The Giralda, or bell tower, part of the old mosque, is probably the finest structure in the city, and is surmounted by a 13 ft. bronze figure of Faith which is a weather-vane (*giraldita*). The Alcázar was in turn the palace of Moorish and Spanish kings. Pilate's House, the isolated Torre del Oro on the river bank, the palace of the duke of Medinaceli, the Maria Luisa park, and the tobacco factory are features of interest.

The museum houses a rich collection of the works of Murillo and Velázquez, both natives of Seville. The exchange or Casa Lonja contains the Indian archives, documents relating to the discoveries on the Spanish Main; and the Columbian library collected by Fernando Colon, the son of the great Christopher Columbus, is in the cathedral. The university,



After Vanteuil



1. Principal gate of the Sintelnio Palace, completed in 1734. 2. South-east corner of the Casa del Ayuntamiento or Town Hall, a Renaissance building of 1526-64, restored in 1891. 3. Cathedral from the south-east,

showing the lofty Giralda tower 4. The city from the Triana suburb, with the Isabel II bridge. On the river bank, right, is the Torre del Oro, a relic of the Moorish Alcázar; in the distance, left, the cathedral

SEVILLE: NOTABLE BUILDINGS IN THE ANCIENT CAPITAL OF ANDALUSIA

deriving from a school founded by Alphonso X in 1256, dates from 1502. Tobacco, chocolate, soap, perfumes, silks, glazed tiles (*azulejos*), and musical instruments are manufactured, and there are iron foundries and machine shops. Pottery is made at Triana.

Since the earliest times a great port, Seville exports wine, fruits, oil, cork, and metallic ores. An important city known to the Phoenicians as Hispal and to the Romans as Hispalis, it was the capital of S. Spain in the dominions of the Vandals. The Moors conquered it in the 8th century, and corrupted the name to Ishbilliah, and from 1026 for more than two centuries it was the capital of a Moorish kingdom; 400,000 Moors are said to have left the city after its capture in 1248 by Ferdinand III of Castile, of which it was for a time the capital. Seville was the richest and most populous city in Spain during the 16th cent., when it had the monopoly of the trade with Spanish America. Pop. 382,000. See Alcázar illus. p. 266; Door illus.

Sèvres. Town of France. It stands on the Seine, between Paris and Versailles, and is famous for its porcelain factory. The chief building is the state factory, and the museum and technical school attached thereto. Pop. 15,242.

Sèvres. Type of porcelain made at Sèvres. In 1756 a factory for making the ware, up to then associated with St. Cloud, was established here, and in 1759 it became state property. The first porcelain produced was of the soft paste type, the product of a complicated mixture, but in 1768 hard paste, a mixture of kaolin and feldspar, began to be used, and ultimately it superseded the soft paste.

Sèvres porcelain comprises handsome vases and large decorative pieces, dinner services, and biscuit figures and groups. The potter's wheel is not used, all pieces being moulded and modelled. The forms chosen are classic in style. In the middle of the 19th century the use of layers of various coloured clays was introduced. See China-ware colour plate; Pottery.

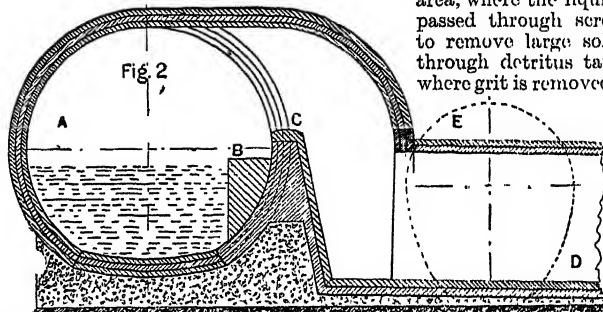
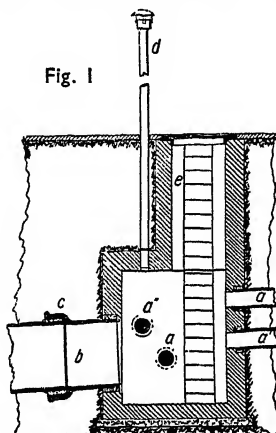
Sèvres, TREATY OF. Peace treaty signed on August 10, 1920, between the Allies and Turkey. It was, however, never ratified by Turkey and was superseded in 1923 by the treaty of Lausanne (*q.v.*). The treaty of Sèvres, had it been ratified, would have limited Turkey's sovereignty in Europe to Constantinople (Istanbul); given

part of Thrace to Greece; placed the rest of Thrace, the Dardanelles strait, the sea of Marmara, the Bosphorus with adjacent islands, and Smyrna (Izmir) under international control; and made Armenia independent, besides limiting the Turkish army and controlling Turkish finance and economy.

Sewage. Waste liquids discharged from houses, waste waters from industrial processes dis-

charged to enter the sewers, by the volume of water used for bathing, and by the volume and nature of the industrial wastes discharged. In some districts the proportion of industrial liquors is so high as to necessitate special methods of treatment; for example at Bradford—a town with a large wool industry—the sewage contains an unusually large proportion of wool fat, which is recovered at the sewage-disposal works.

At many towns on the sea coast, or on large estuaries, the sewage is discharged into the sea or the estuary without treatment. Sometimes, to prevent such nuisance as fouling of bathing beaches, it may be treated by macerating the larger floating and suspended solids, or suspended matter may be removed by sedimentation before the sewage is discharged. Inland, however, where the sewage has to be discharged to fresh-water streams, much more extensive treatment is necessary. Irrigation on land called sewage farms is successful, but requires a very large area of land, and in Great Britain is no longer much used. Instead, sewage is treated in works occupying a much smaller area, where the liquid is passed through screens to remove large solids, through detritus tanks, where grit is removed by



Sewage. Diagram illustrating its disposal by sewers. Fig. 1. Junction box receiving sewage from small drains, a, and discharging by the large earthenware drain, b; c is a cemented spigot and faucet joint, d, the ventilating shaft, and e, the manhole. Fig. 2. A, sewer; B, footpath; C, sill over which the flood sewage flows into sewer, D, which leads to river or sea, or to intercepting sewer, E.

charged to municipal sewers, and any rain water which enters the sewers by direct discharge or by infiltration. In the U.K. the average volume in dry weather is some 35 galls. per day per head of those connected to the main drainage, but may be much greater in wet weather. Sewage contains coarse material in suspension—including grit, vegetable matter, and particles of faeces—and also contains colloidal and dissolved substances. Its composition varies considerably from place to place and is influenced particularly by the proportion of rain water al-

sedimentation, and through much larger sedimentation tanks to remove as much as possible of the finer suspended particles as a watery sludge (primary sludge). After the sludge has been removed the sewage is still a very polluting liquid, and at inland towns is usually further treated by biological filtration (*see Filtration*: Sewage) or by the activated-sludge process. In the activated-sludge process the settled sewage is passed through tanks in which it is aerated, either by bubbles of air passed into it through diffusers at the bottom of the tanks or by

mechanical means. Several types of mechanical plant are available; they are designed to stir the liquid in various ways so as to accelerate the solution of oxygen from the air. Flocs of activated sludge are formed, consisting for the most part of masses of bacteria, which are the chief agents for the purification of the polluting matter. From the aeration tanks the liquid, containing the activated sludge in suspension, is passed through separating tanks to remove the sludge, part of which is returned to the aeration tanks to maintain the concentration of the flocs at an optimum value. From this process effluents of good quality can be obtained; the final liquid is generally similar in composition to the final effluent from a works using biological filtration.

From a few towns situated on estuaries sludge is taken out to sea in special sludge vessels and is there dumped. At a few inland towns the liquid sludge is supplied by pipe line to agricultural land and is allowed to flow over the surface or is run into prepared trenches. Usually, however, sludge is treated at the sewage works to remove as much moisture as possible so that it can be more easily handled. The simplest process is to allow it to drain on specially constructed under-drained sludge-drying beds. When it is dry enough to be lifted with a spade or by mechanical equipment it is removed, to be used on the land in place of farmyard manure. It contains available nitrogen, though often in relatively small amounts, together with some available phosphate, but little potash. At larger works the sludge is often digested under anaerobic conditions before being run on to the drying beds. During digestion a mixture of gases—mostly methane and carbon dioxide—is evolved, and is often used for heating and for driving gas engines to provide electric power. A relatively small quantity is compressed and used to drive motor vehicles; it also has possibilities as a raw material in the chemical industry.

B. A. Southgate

Seward. Town of Alaska, the ocean terminus of the Alaska rly., which runs to Fairbanks 470 m. N. At the head of Resurrection Bay, 60° N., 149° 30' W., Seward is a trading centre for the scattered pop. of the Cook inlet dist. and the Alaskan peninsula and for the Aleutian Is. Pop. 700.

Seward, ANNA (1747-1809). British poet, called the Swan of Lichfield. Born at Eyam, Derby-

shire, she was brought up in Lichfield, where her father became a canon. Encouraged by Dr. Erasmus Darwin, she began to write poetry, but she is remembered today rather by her friendship and correspondence with Hayley, Mrs. Piozzi, and Sir Walter Scott, for the last named of whom she had the warmest admiration. She died March 25, 1809. Of her own works, *Louisa*, 1782, and her *Sonnets*, 1799, are the best known. She also left six volumes of letters. *Consult* A Swan and her Friends. E. V. Lucas, 1907; *The Swan of Lichfield: selected correspondence of Anna Seward*, H. Pearson, 1936.

Seward, WILLIAM HENRY (1801-72). American statesman. Born in New York State, May 16,



William H. Seward

1801, and educated at Union College, he became a lawyer in 1822. Activity in the politics of the state led to membership of the senate of the New York legislature and to the governorship of that state (1838-42), and brought him into association with the anti-slavery movement. In national politics he was a Whig, and was one of those who held that a fugitive slave was free as soon as he got on to free soil.

In 1849 Seward became a member of the senate, where he strongly denounced slavery, and was one of the founders and leaders of the Republican party. He was not, however, put forward as a candidate for the presidency either in 1856 or in 1860; instead, he became Lincoln's secretary of state, and remained in office until 1869. His work throughout a most difficult period was for the most part successful: it included the management of the Trent and Alabama difficulties, the French interference in Mexico, and the purchase of Alaska from Russia, as well as the reconstruction measures that followed the Civil War. In April, 1865, he was

wounded at Washington, on the day of Lincoln's murder, his wife's death being one result of this outrage. He died Oct. 10, 1872. *See* Lincoln; Republican; United States. *Consult* Lives, T. K. Lothrop, 1899; F. Bancroft, 1899; E. E. Hale, 1910.

Sewell, ANNA (1820-1878). British author. She was born at Yarmouth, March 30, 1820, the daughter of Mary Sewell (*v.i.*). In early childhood she injured both ankles and was a lifelong invalid in consequence. She attained fame as a result of the publication in 1877 of *Black Beauty*, a book purporting to be the autobiography of a horse. This attained enormous popularity, over 100,000 copies being sold in 15 years. French, German, and Italian translations were almost equally successful. Anna Sewell died in April, 1878.

Sewell, MARY (1797-1884). British author. Born April 6, 1797, the daughter of John Wright, a Norfolk farmer, she was educated at home, married in 1819, and settled in the S. of England. Her children's books and poems attained an extraordinary popularity, over 1,000,000 copies of her *ballad Mother's Last Words* being sold in 1860. Her last years were spent near Norwich, where she died, June 10, 1884.

Sewing Machine. Machine for performing the operation of stitching by mechanical means. Thomas Saint patented a machine in 1790, chiefly for sewing leather. It possessed an automatic feed, continuous thread, an awl that punched a hole for the needle, which moved with a vertical reciprocating movement. The needle was forked and pressed the thread through the hole, a reciprocating hook beneath the material passing thread through to form a chain stitch.

Barthélemy Thimonnier, in France in 1830, invented a machine in which a hooked needle passed backwards and forwards through the material to form the stitch. The machine was worked by a treadle. Very successful and much copied, it brought no reward to its inventor. Newton and Archbold, in 1841, made an important advance with their patent of the eye-pointed needle, and in 1846 Elias Howe patented the first lock-stitch machine, though its essential features had been anticipated by another American inventor Hunt.

In Howe's machine, basis of most contemporary sewing machines,

the needle was curved, had a reciprocating horizontal instead of a vertical motion, and was eye-pointed. A shuttle on the underside of the cloth working in conjunction with the needle produced a lock-stitch. A. B. Wilson's later invention of a four-motion feed and I. M. Singer's fixed overhanging arm are both widely used.

Sewing machines produce lock-stitch, and simple or double chain-stitches. The majority of household sewing machines are of the lock-stitch type, but the principle of machine sewing is the same for all types of stitch produced. There is a reciprocating eye-pointed needle, which moves through the material being stitched. The material rests on a steel plate, and is automatically moved forward with each stitch by a small toothed bar or feed dog. In making the chain-stitch the needle passes through the material, and a small loop is formed on the underside of the material. Through this loop a hook passes and holds it while the needle ascends. At that moment the material is moved forward, and on the next return of the needle the latter passes through the held loop and forms a fresh loop within the first. The first loop is automatically released and the second held, the first being drawn up tightly against the underside of the material to form the stitch, and the series of operations is repeated. The reciprocating hook which seizes each loop in turn is called the looper. The disadvantage of the chain-stitch is that the line of stitching unravels if broken at any point.

In the lock-stitch a loop is

formed when the needle passes through the fabric, and through this loop a second thread is passed by means of a vibrating shuttle or by a hook with a rotating movement. This second thread interlocks with the first thread in the centre of the material. The cotton or thread is kept at a suitable tension to ensure a tight stitch by means of steel plates held together by an adjustable spring.

SEX: EVOLUTION AND TRANSMISSION

Paul G. 'Espinasse, Professor of Zoology, Hull

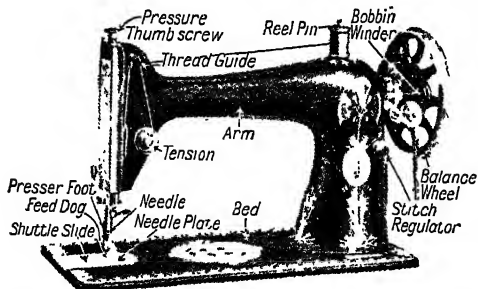
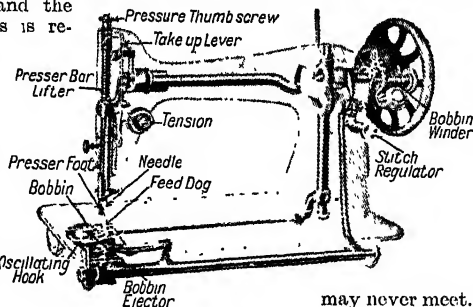
This article explains the process by which sex is transmitted and developed from generation to generation. With it should be studied the articles on Chromosomes; Endocrinology; Gene; Gonad; Hormone; Meiosis; Oestrous Cycle; Pituitary Body; Prostate Gland; Protozoa; Reproduction

Sex (Lat. *secare*, to cut) is the term used with reference to the differences between the male and the female of a species. Before the fusion of the sexual elements, egg and sperm, there are two organisms; after its completion there is one. The division of the individuals of so many species of animals and some plants into two groups in each of which the members produce one kind of gamete, or sexual cell, does not, in itself, promote reproduction directly. Indeed, the separation of the individuals into groups of this kind adds a very great hazard to reproduction: the elements whose fusion must precede development

ments' of the two kinds required for fusion, are the rule. In such cases the sperms and the eggs from one individual may fuse with each other, or two individuals may still be needed since the sperms of one will fertilise the eggs of the other only; but the total output of offspring will be great, since so large a part of the energies of the animals is devoted to the production of enormous numbers of both eggs and sperms. Since sexual reproduction is widespread, and since natural selection seems to put a premium on efficiency, it would seem that there must be some compensating advantage in the process.

The explanation of sex lies in the nature of the process of living. Life has been well defined as the mode of existence of certain proteins. These substances replicate themselves, and, in association, form hierarchies. These hierarchies may be very complex indeed, and can only with the greatest difficulty be analysed sufficiently to be usefully understood. They are hierarchies of function: different elements do different things in the functioning whole, and these different things may be of different degrees of consequence. The cooperation of the elements of this hierarchical association is the life of the organism that can be seen, the molecular aggregate that can be touched. There are far more molecules and atoms in an adult organism than there are in the egg and the sperm from which it commonly, though not universally, originates. These have been captured by the key molecules in the egg and sperm, and used and built-in in their replication and in their further organizing of their immediate surroundings. It is in this replication by capture and

may never meet. In some forms, for instance in many internal animal parasites which have reduced chances of getting about and meeting each other, this risk becomes so great that the primary separation of individuals in this way is overborne, and hermaphrodites, capable of producing ele-



Sewing Machine. Working parts of hand or treadle machine. Top, right, diagram indicating the working of the sewing mechanism

By courtesy of the Singer Sewing Machine Co., Ltd

organizing that both growth and reproduction consist. In particular the heart of the process of reproduction lies in the replication of the key molecules called genes and the parting of the replicas from the originals so that the replicas may initiate new organisms by their replication and organizing.

Effect of Changed Genes

Now, the structure of genes is liable to change. Changes are very rare indeed, but they do occur. They probably happen by the arrival of energy in the form of radiation, and they probably happen through an imperfection of replication. An imperfect replica, or a gene changed by radiation, if it is still viable, will replicate itself in the new form. It is of the very essence of an organism to be a cooperative effort, so that a change in any cooperating element is likely to lead to consequential changes in the cooperative product. These differences in the end product may increase or decrease the efficiency of the organism in the circumstances obtaining; but these circumstances obtaining are themselves subject to change, and while an alteration of the end product might be bad for it on one occasion it might be good on another. Further, since the end product is the result of a cooperative effort, any particular change in any co-operating element may have one effect among one set of cooperative colleagues and another in different company. It is for these reasons that any system which would allow a changed gene to have more than one chance of showing its worth would be of great value. Changes in genes are rare, and if a changed gene can be tried round in all sorts of company and in all sorts of circumstances it may fit somewhere most profitably. There is a system which will give this chance: *viz.* the issuing of key molecules or genes in pairs, of which one member can be regarded as the great conductor and the other as his imperfect replication or understudy. The great conductor, or dominant gene, directs operations, and his understudy does at least little harm in the guise of a recessive gene. It will be seen at once that if conductors and understudies are allowed to change orchestras and to recombine in pairs, so that sometimes two conductors and sometimes two understudies might find themselves face to face with any orchestra, as well as a conductor and any understudy, then the

chance of an understudy making good and finding an orchestra he could conduct, in circumstances where they would do as he told them, would be very greatly increased. It is just such a series of possibilities that sexual reproduction lays before a changed or mutated gene. It is here that the enormous advantages of the sexual process really lie.

The fusion of egg and sperm mediates the addition (not the fusion) of genes, for genes are discrete entities. It is obvious that if such additions of genes went on from generation to generation gametes would soon be carrying vast numbers of them. This is avoided by the process of meiosis, by which the genes are reduced to half their number in the gametes. The whole number, or double set, is restored at the moment of fertilisation. The single set issued to a gamete by the organism making it, that is by an animal making sperms or making eggs, consists of a set which is whole, but of which any member may be derived from the animal's father or the animal's mother. While the fertilised egg, or zygote, must get all its ordinary genes in a double set, one set from each parent, any particular ordinary gene may have come to it from any of its four grandparents, and any pair of ordinary genes from any two, and from only two, of its grandparents. It is this recombining generation after generation that provides the very large possibility of change in genetic company for genes and permits useless or harmful genes to persist as recessives in the company of their valuable dominant partners.

Survival of the Good Genes

The effect of a recessive gene shows when it is present twice. If this effect, thus permitted to show, is bad, the organism dies or does not reproduce in its turn; if it is good it survives and perhaps wins in competition with its more old-fashioned relatives. But what may be bad today in one company of colleagues may be good tomorrow in another, and in a different place and in different circumstances. It is the system of reproduction called sexual that gives this huge advantage. In nature animals are directed by genes that have thus become dominant; they also carry recessives waiting for time and chance to set out in their turn on the road to dominance.

In many forms, *e.g.* in many protozoa, where fusion of two

individuals, or of parts of two individuals, does not seem to occur, most complex arrangements are found which procure some degree of recombination of genetic elements.

Recombination of Genes

A myriad details of structure and behaviour have come to subserve recombination of genes. Mechanisms have evolved which primarily determine the sex of each individual at fertilisation. By far the most common system here is the location of certain key sex-determining genes on the members of one particular pair of chromosomes. In man, for instance, there is a pair of chromosomes called the X chromosomes which, when present complete, determine the development of the primary female organ or ovary. If only one member of this pair is present in a fertilised egg and the place of the other is taken by a somewhat defective chromosome called the Y, then what develops will not be an ovary at all, but a testis; that is to say, sperms (which are made by a process of meiosis at which the X and the Y are separated, and one, but not both, goes to each sperm) are of two kinds, X and Y, whereas eggs, made by an organism with two similar Xs, are all alike X. It is for this reason that in each generation about half the offspring are male and half female, because half the X eggs will gain another X and be female by construction while half of them will gain the Y and be male by construction. Actually, in many forms, man among them, the Y sperms seem to be more efficient and to fertilise eggs more often than do X ones. There are therefore far more male conceptions than female. But more male than female organisms die young, because the X chromosome has many recessive, sex-linked genes on it, some harmful. These are likely to do no harm if they are masked by a beneficent dominant on the other X, but prove fatal in the male where the Y is too reduced to do much effective masking.

In insects and some other forms the genes, distributed to each cell as the embryo develops, control directly the multitudinous qualities distinguishing the sexes. In mammals and birds, as well as in many other forms, their control is not so direct; their function is chiefly to determine the gonads so that these are differentiated as either ovaries or testes. As the gonads are differentiated, they lead

the organism to produce hormones of the male- or of the female-determining kind. To these hormones and similar substances the developing organism is remarkably accurately attuned in its various parts. It is this precision of response, rather than the complication of the hormone, that is important. The elements of both the male and the female reproductive systems are present in the embryo, but if there is an ovary only the female system of oviducts, uterus, and vagina flourishes. If there are testes present, determined by the XY genetic make-up of the embryo, the female system is reduced to a few small vestiges some of which get built into the prostate gland at the base of the bladder against the front wall of the lower rectum.

Influence of the Endocrines

These vestiges retain their sensitivity to female hormones, and if in later life they become subject to their action through any derangement of the system which leads to the production of female hormone instead of male, or through the breakdown of male into female hormone, they may enlarge and play some part in prostatitis. In the mammals the milk glands are present in both sexes and enlarge in the female in response to progesterin and associated substances produced by her metabolism. The whole endocrine system cooperates to produce and to preserve one sex or the other according to whether an ovary or a testis has developed as a result of the embryo's having chromosomes of the male (XY) or female (XX) kind. Any disturbance of any member of the endocrine set can result in a disturbance of the differentiation. The adrenals, for instance, if they become deranged, may affect the growth and distribution of the hair and the disposition of the individual. The master-gland, the pituitary at the base of the brain, controls the functioning of the gonads of both sexes, but in profoundly different ways. The behaviour, the desires, and the structure of the two sexes are geared through the pituitary to ensure that eggs and sperms shall meet at the right time and in the right place. Nest-building, parental care, male aggressiveness, all subserve the purpose of reproduction by this difficult and elaborate means, and all are organized in the different forms of the oestrous cycle through the endocrine systems of the sexes which complement each other.

In some worms the differentiation of sex seems to depend directly on circumstances—a developing egg goes male if it falls near a female and female if it is allowed to develop without that influence. In some forms sex changes as time goes on, and each individual passes through a stage in which it is of one sex and proceeds to another stage in which it is of the other. In some forms polygamy is the rule, in some polyandry, and in some monogamy. There seems, indeed, scarcely a limit to the ways in which the meeting of sperm and egg can be organized.

Sexagesima (Lat., sixtieth). In the Christian calendar, the Sunday which falls eight weeks before Easter; hence its earliest date is Jan. 25 and latest Feb. 29. It is not exactly the sixtieth day before Easter, but its name arises by extension from Quinquagesima, the following Sunday, which is the fiftieth day before Easter. *See* Calendar.

Sex-Determination. Method by which nature arranges the proportion to one another of the sexes in any species. The advantages to be reaped from the recombination of the genetic units made possible by sexual reproduction can be enjoyed only if the species concerned has developed an efficient means of ensuring the continued production of eggs and sperms. These may be produced by the same individual, called an hermaphrodite (*q.v.*), but more often, in the higher animals, the dimorphism of the gametes occurs through a dimorphism of individuals in the species—a dimorphism of structure and behaviour recognized universally and called the division into the two sexes, the members of one of which produce one kind of gamete, sperms, and members of the other kind eggs. But sexual dimorphism is by no means the only kind of dimorphism known. There are also many examples of polymorphism, in which a number of forms coexist to make up a species fertile within itself.

These dimorphisms or polymorphisms are for the most part nicely controlled by a genetic mechanism. To take a simple instance, there are two forms of guillemot, one with, and one without, a ring round the eye and a streak passing backward. The form having this is called the bridled form and it is spreading in Great Britain. So far as can be observed, there is no advantage

to the species in having in it any particular proportion of bridled and unbridled forms; but it is far otherwise with a dimorphism subserving the production and meeting of eggs and sperms. According to the organization of the sexual lives of the animals in the species—polygamy, polygyny, monogamy, polyandry—the proportions of males and females are important. The genetic mechanism of sex-determination provides a means of arranging these proportions extremely neatly.

A genetic mechanism gives a division of individuals in terms of genes, while the adult is an expression of an interaction, more or less prolonged, between the genes among themselves and between the genes and the rest of the environment. Simple and absolute as the division of genetic types into male and female may be, the division of resulting adults into males and females is not absolute or qualitative, but partial and quantitative. It is customary to call the chromosome carrying the important key-genes of sex-determination the X chromosome. Its opposite number may be reduced, when it is called Y, or absent, when the missing member is represented by O. The rest of the chromosomes are called collectively autosomes. Each egg and each sperm receives an X in the homogametic sex (that having two Xs), only half the eggs and sperms receive an X in the heterogametic sex (that having one X and a Y or O).

Differentiation of the Sexes

The organism resulting from the union of egg and sperm must then be either homogametic or heterogametic, and in different groups one or the other will produce an adult of either sex. Thus in the mammals two X chromosomes will ensure in their cooperation with the autosomes the development normally of an ovary, and one X the development of testes; but in birds, and in moths, one X gives an ovary and two a testis. In some minnows the key genes are very few, and close together. Here it is possible for them to cross over all together on to their opposite chromosome the Y, and indeed some species of minnows are male with two Xs, and some female. Where there are many key-genes, crossing-over seems to be suppressed. Because normal development depends on the cooperation of a sexual set of genes and autosomes, if crossing-over broke a set of key genes

disaster would follow, and it is probable that as evolution has proceeded different groups have settled down with different but safe arrangements for preventing this.

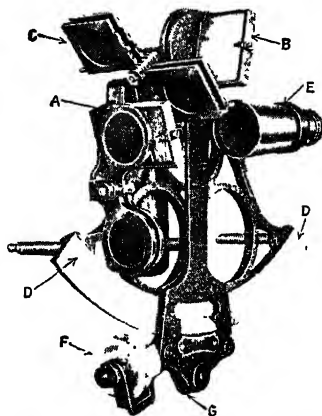
In hermaphrodites there would not seem to be any sexual differentiation at all, so that no such genetic mechanism need be supposed to exist. In some forms (e.g. *Bonellia*, a worm) there is a very sharp sexual differentiation, but there does not appear to be any genetic mechanism. Here the egg develops into a female if it falls on the sea-floor by itself, and into a male if it falls near an adult female. In the insects the genetic mechanism seems to control each step in sexual development. The same race may establish different gene-complexes in members that have evolved far apart from each other geographically so that they have not crossed and mingled genes for a great number of generations. Goldschmidt crossed two such individuals of the gipsy moth (*Lymentria dispar*), and produced a large series of graded intersexes (see Intersex).

Changes of Sex

In a number of forms as the life of the individual proceeds a change of sexual function normally occurs. In some molluscs, for instance, the youngest are male, the next older hermaphrodite, the oldest female. In barnacles, too, a similar series of stages is normally passed through. In birds there seems to be a series of waves of proliferation of reproductive tissue during the normal development of the embryo, and the genetic constitution (XX or XY) settles which wave shall succeed in establishing a gonad, and thus, since the waves are not all productive of the same kind of tissue, whether the gonad established shall be an ovary or a testis. Once established, the gonad, by mediating the production of sexual hormones and active substances, imposes the development of oviduct or sperm duct, and all the other secondary sexual characters.

It occasionally happens that tuberculosis or some other disease may destroy the ovary in a hen. If the bird survives a gonad will regenerate, but the tissue will, so to speak, belong to the next wave of proliferation, and will give a testis. This will impose the development of male qualities, and here is the explanation of the authenticated cases of sex reversal in fowls. In the mammals the same sort of dependance of the

secondary sexual characters is found, and if anything happens to interfere with the production of the proper substances by the gonad, harmonic intersexes will result in which the clitoris, for instance, in the female may tend towards a structure of a penis, and the prostate gland of a male may tend to proliferate what should be a uterus. In this group the elements of the female system (the Mullerian system) and the elements of the male system (the Wolffian system) coexist in the embryo, and the substances produced by the gonad encourage one and discourage the other. Intersexes of this group are quite different in kind from those found in the *Lymentria* moth, when the disturbance is in hormones but in genes. The difference between



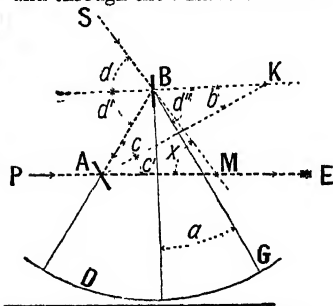
Sextant. Left, micrometer model used in navigation. Right, diagram explaining the principles upon which it is worked. See text

hormonic and genetic sex-determination is quantitative. In insects, genes determine cell by cell the character by which the sex of an individual can be distinguished through this control of metabolism at the site of the development of the structure. In mammals and birds, genes determine the characters by which the sex of an individual can be distinguished through their control of the development of the gonad into a testis or an ovary. In mammals and birds, therefore, the circulating and seeping hormones provide an extra chance that something may go wrong as a result of errors in the production of their substances. Natural selection sees to it, however, that sex-determination is good enough in all groups to ensure the production and the meeting of gametes, and hence the continuance of the race.

Paul G. Espinasse

Sextant. Instrument used for measuring angles between distant objects. It forms part of the equipment of the navigator, who uses it daily to measure the sun's altitude at noon, in order to determine the latitude of the ship. It consists essentially of a segment of a circle, on which is a scale or arc divided to about 130 degrees, a telescopic eyepiece, an index mirror placed at the centre of the circle, but fixed to a movable arm, at the end of which is a tangent screw to record the angle, and a fixed second half-silvered horizon mirror. In the illustration (which shows a micrometer model), A is the half-silvered horizon mirror, B the central index mirror, C two of the coloured shades for use in solar observations, D the scale or arc, E the telescope, F the micrometer head for reading minutes and seconds, and G the end of the movable arm.

The observer sights one distant object (P) through the telescope and through the unsilvered half of



mirror (A), and moves the index arm (G) until he can see the second object (S) in the silvered half of the mirror (A) immediately below the object (P). The angle between S and P can now be read on the graduated scale or arc (D). When the index arm is at zero on the scale, the mirrors must be parallel; adjusting screws are provided to secure this condition, and to make them perpendicular to the plane of the instrument. The actual divisions on the scale are marked in degrees, although each scale degree is actually only half an angular degree in size. This is due to the principle of the instrument, for the angle through which the index arm (G) is moved is only half the actual angle to be measured. In the diagram, a is the angle through which the index arm is moved; KA and KB are perpendiculars to the mirrors, and the angle b between them is equal to

a. The angles c and c' between the incident and reflected rays at A and AK are equal. The angle x between SM, the direction of S, and PT, the direction of P, is the angle to be measured. The angles d and d' between the incident and reflected rays at B and BK are each equal to d'' . $x+c'=d''+b$, and $d'=b+c$, hence $x=2b=2a$. See Compass; Navigation.

Sextet or **SESTET**. Composition for six solo voices or instruments. Owing to the difficulty of writing in six real parts, specimens are comparatively rare, but Spohr, Raff, Dvorak, and Brahms have essayed this form of composition for strings only. Beethoven wrote two: one for wind instruments, and one for two horns in addition to strings. The term has also come to be used for the players concerned, as with quartet (*q.v.*).

Sexton (contracted from sacristan). In the Church of England, a parish official appointed, jointly by the incumbent and the church council, as keeper of the various things used in divine worship. Among his duties are the cleansing, lighting, and heating of the church, the filling-up, and sometimes the digging, of graves, tolling the bell, etc. In town churches these duties are usually performed by the vergers, except the cemetery duty, which is fulfilled by cemetery employees.

Sexton, **SIR JAMES** (1856–1938). British politician. He was born, of Irish parentage, at Newcastle, and went to sea when 13. Later he occupied various positions in the trade union world, being general secretary of the National Union of Dock Labourers, 1890,



Sir James Sexton,
British politician

and president of the T.U.C., 1905. From 1918 to 1931 he was Labour M.P. for St. Helens, being knighted in the latter year. He also wrote much for the Labour press, and in 1936 published a book of reminiscences, *James Sexton, Agitator*. He died Dec. 27, 1938.

Sextus Empiricus. Greek philosopher and physician, called Empiricus as belonging to the empirical medical school. He flourished about A.D. 200. In two extant works, *Outlines of Pyrrhonic Philosophy*, and *Against the Mathematicians*, he clearly sets forth the principles of the extrem-

ist Greek sceptics. No proof of any truth, no knowledge, is possible. The existence of bodies cannot be proved, and cause has only a relative meaning. See Scepticism.

Sexual Selection. One of the modes of Natural Selection (*q.v.*). In many animals striking characteristics distinguish one sex or the other, more commonly the male. These may be of appearance and structure or of behaviour or of both. It was at first thought that the existence of such peculiarities as the peacock's display meant that through the evolution of that species peahens had tended to select as their mates the most gifted exhibitionists among their suitors. Later it came to be considered that the display was not so much concerned with the selection of a mate as with the stimulation of the female so that, already paired off, she should permit copulation with her mate at suitable times. It is the pair that achieves simultaneously a desire for sexual intercourse that produces young and rears them. In this sense the pair may be said to be selected as parents.

Seychelles. British possession in the Indian Ocean. With its dependencies, the Seychelles group of islands comprises 92 islets and islands, with a total area of 156½ sq. m. Mahé, the chief island, accounts for a third of the area. Islets in the main group are Praslin, Silhouette, La Digue, Curieuse, Félicité; the dependent islets include the Amirante islands, Cosmoledo group, Assumption, the Farquhar islands, and the Aldabra islands. Incorporated as a dependency of Mauritius in 1810, the Seychelles was made into a separate colony in 1897.

Cotton, rice, and tobacco are cultivated. The exports include copra, guano, cinnamon, vanilla, and coconut oil. Phosphate deposits are also worked. Victoria on Mahé has a good harbour, and is an Admiralty coaling station. Reported to have been discovered in 1505 by the Portuguese Mascaregnas, the Seychelles were later a haunt of pirates; about 1750 they became French and have been held by Britain from 1794. Pop. 33,621.

Seyhan. Vilayet of Turkey. Its capital is Adana (*q.v.*), which is sometimes also called Seyhan. Agriculture is the chief occupation of the vilayet; wool, grain, cotton,

wine, and fruit are exported. The river Seyhan, flooding of which caused the loss of 2,000 lives in 1947, flows through it.

Seyler, **ARTIENE** (b. 1889). British actress. Born May 1, 1889, she was educated at Bedford



Athene Seyler,
British actress

College and the R.A.D.A., making a successful first stage appearance at the Kingsway Theatre, London, in *The Truants*, 1909.

With great vitality and exceptional technique, she excelled in Restoration comedy, *e.g.* *The Way of the World*, *Love for Love*, and *The Country Wife*. She joined the Old Vic company in 1933, and played in Shakespeare, Chekhov, and Wilde. Other memorable performances were in *The Dover Road*, 1922; *The Mask and the Face*, 1924; *The Circle* (revival), 1931; *Watch on the Rhine*, 1942. She appeared also in many films. She collaborated with Stephen Haggard in writing *The Craft of Comedy*, 1944. She became president of the R.A.D.A., 1949.

Seymour. Town in Anglesey co., Victoria, Australia. It is on the Goulburn river, 61 m. by rly. N. of Melbourne, and is an important road and rly. junction, the centre of an agricultural and pastoral area, and the site of a military camp and an officers' training school. Pop. 3,000.

Seymour. Name of a famous English family, now represented by the duke of Somerset and the marquess of Hertford. It is a variant of St. Maur. One of that family long settled in Monmouthshire married about 1360 an heiress of the family of Beauchamp. Their son, Sir William St. Maur, had estates in the west of England, and his descendant, Sir John, who called himself Seymour, was the father of Edward Seymour (*c.* 1506–52), made duke of Somerset and lord protector. Edward's sister was Jane Seymour, third queen of Henry VIII. Many Seymours served the state in various ways, and Francis Seymour Conway was made marquess of Hertford in 1793. See Hertford, Marquess of; Somerset, Duke of.

Seymour of **SUDELEY**, **THOMAS** SEYMOUR, **BARON** (*c.* 1508–49). English admiral. He was son of Sir John Seymour of Wiltshire, and brother of Jane Seymour. Employed by Henry VIII on various



Seychelles arms

diplomatic missions, he was appointed ambassador to the Netherlands and marshal of the English forces there during the Spanish war, 1543. He served as master of ordnance and admiral of the fleet in the French campaign, 1544. After Henry's death he was made lord



Baron Seymour of Sudley,
English admiral
After Holbein

high admiral and secretly married the king's widow, Catherine Parr. Seymour then commenced against his brother the duke of Somerset, a series of intrigues which resulted in his arrest for treason and his execution on Tower Hill, March 20, 1549.

Seymour, JANE. For details of the third queen of Henry VIII, see Jane Seymour.

Seymour, ROBERT (c. 1800-36). British artist. Born in London, of poor parents, he received a scanty education, and was apprenticed to a pattern-drawer. He spent his leisure in sketching and painting miniatures, and when his apprenticeship was over be-



Robert Seymour,
British artist

came a professional artist. During 1833-36 appeared his *Humorous Sketches*, frequently reprinted, and from 1831 to his death he illustrated *Figaro* in London. An invitation to Dickens to provide letterpress for a series of Cockney sporting pictures by Seymour led to the publication of *The Pickwick Papers* in 1836. But Seymour, whose increasing moroseness had been exacerbated by a quarrel with the editor of *Figaro* in London, shot himself, April 20, 1836, before the second part of *Pickwick* was published. See *Pickwick Papers* and *illus.*

Seyne-sur-Mer OR LA SEYNE. Seaport of France, virtually a suburb of Toulon. In the dept. of Var, it stands on an opening of the Mediterranean, just opposite Toulon. Connected by rly. and steamer with Toulon, it has ship-building yards. Pop. est. 27,000.

Seyss-Inquart, ARTUR (1892-1946). Austrian politician. He was born in the Sudeten area July 22, 1892, and educated at Vienna

university. In 1928 he joined the Austrian Nazi party, and as one of its leaders prepared the way for Hitler's occupation of Austria in 1938. After the Anschluss he became governor of the country; following the German invasion of Poland in 1939 he was deputy governor-general of that country until in May, 1940, he became high commissioner of the German-occupied Netherlands, where he was responsible for the deaths of many Dutch Jews and resistance workers. Captured in Germany, May 8, 1945, he was charged with war crimes before the Nuremberg tribunal, sentenced to death, and hanged on Oct. 16, 1946. *Pron.* Sice-ink-vart.



Artur Seyss-Inquart,
Austrian politician

Sezze. City of Italy, the ancient Setia. It is in the prov. of Littoria, 52 m. by rly. S.E. of Rome, and stands on a hill overlooking the wide unpopulated waste of the Pontine marshes. The Gothic cathedral dates from the 4th century. Ruins of the ancient city walls built of massive stone blocks and of a similarly built temple exist. Sezze became a Roman colony in 382 B.C. Pop. 7,000.

Sfax. Seaport of Tunisia. It stands on the N. shore of the Gulf of Gabes, about 150 m. S. of Tunis, to which there is a rly. line. There is trade in fruit, nuts, olive oil, sponges, phosphates, and esparto grass. In the Second Great War Sfax was entered April 10, 1943, by the British 8th army pursuing the Axis forces after the battle of the Mareth Line (*q.v.*). Pop. 43,333.

Sforza. Name of Italian family that succeeded the Visconti as dukes of Milan, holding the throne



Francesco
Alessandro Sforza,
Duke of Milan

from 1450 to 1535. The name Sforza (strong) was first given to Muzio Attendolo (1369-1424). He was of peasant stock, and became a soldier of fortune, fighting, among other allegiances, for Florence, 1401, Pisa, 1405, Pope John XXIII, and Naples, of which he became constable. His son, Francesco Alessandro Sforza (1401-66), entered the service of the Visconti, 1426, but his allegi-

ance changed, and he fought against Visconti for Florence, 1437-39. After capturing Milan, 1450, he made himself duke. Though a reckless and profligate man, he was a patron of refugee scholars from Constantinople.

The duke's son, Galeazzo Maria (1444-76), served under Louis XI of France, and, earning the bitter hatred of his subjects, was assassinated. His daughter was Caterina Sforza (1463-1509), famous for her great courage and resource when besieged in Forlì by Cesare Borgia and his French auxiliaries, 1499. When forced to surrender Forlì, she was for a time imprisoned in Rome, and died in Florence. Galeazzo



Galeazzo Maria
Sforza, Duke of
Milan

zo's sons were Gian Galeazzo Maria (1468-94) and Ludovico il Moro, or the Moor (1451-1508), who imprisoned and probably poisoned the former, seizing power in 1489. He was the patron of Leonardo da Vinci, opposed Charles VIII, and lost Milan to Louis XII in 1499, dying a prisoner at Loches in Touraine. The last duke of the line was Francesco Maria (1492-1535), who lived obscurely and died without heir. See Milan.

Sforza, CARLO, COUNT (b. 1873). Italian statesman. He was born, Sept. 25, 1873, at Montignoso di Lunigiana.

After graduating from the university of Pisa, he entered the diplomatic service, being minister to China, 1911-15, minister to Serbia, 1915-18, Italian high commissioner in Turkey, 1918-19, ambassador to France, Feb.-Nov. 1922, when he resigned on Mussolini's seizure of power. He had been foreign minister 1920-21. He was a vigorous opponent of fascism from its beginning, and led the democratic opposition from 1922 until political parties were suppressed in 1926, leaving Italy for France in 1928. On the German invasion of France in 1940, he went to the U.S.A., where he was active in anti-fascist propaganda. At the Montevideo conference of free Italians (1942), he was proclaimed leader of the free Italian



Count Carlo Sforza,
Italian statesman

movement. After the Allied armistice with Italy, 1943, he returned to his country where he associated himself with the Action party, which wanted to abolish the monarchy. This led the British to view him with disfavour, and it was not until after the king's abdication that he became minister without portfolio in 1944. He became president of the consultative assembly, 1945-46, and minister of foreign affairs, 1947.

Sganarelle. Character in several of Molière's plays, notably *Le Médecin Malgré Lui* (q.v.) and *L'École des Maris* (q.v.). It is also the title of one of his less well-known plays, of which a translation in broken English forms the second act of Sir W. Davenant's *The Playhouse* to be Let. Sganarelle was also translated by Sir John Vanbrugh.

Sgraffito (Ital. *sgraffiare*, to scratch). Term applied to certain methods of mural decoration and pottery work. In the former, a layer of white plaster is laid over one of black, and the top layer is excised so as to expose the black underneath in the required pattern. The effect thus produced resembles, at a distance, that of a coloured bas-relief design. In pottery, the term is applied to the process by which a clay of one colour is superimposed upon one of a different, and a design produced by cutting away the outer coating. This method of decorating earthenware is probably of Italian origin; examples of 15-17th century *sgraffiti* are to be seen in the British and Victoria and Albert Museums.

Shabatz OR SABAC. Town of Yugoslavia, in Serbia. It is situated on the Save, 38 m. W. of Belgrade, and was a prosperous town before the First Great War. On the edge of the fertile plain known as the Matchva, lying in the angle between the Save and the Drina, it had a considerable trade in grain and cattle. Its strategic importance led the Romans and the Turks to fortify it. During the First Great War it was occupied by the Austrians, Aug. 12, 1914, and evacuated by them twelve days later. Shabatz was occupied by them for a short time again in 1914, but they lost it in Dec., after the battle of the Kolubara. It passed to them once more in Sept., 1915, and remained in their hands till the beginning of Nov., 1918.

Shabatz, BATTLE OF. Called also the battle of the Jadar, this was fought in Aug., 1914, between the Austrians and the Serbians. By Aug. 15, 1914, the Austrians,

in their first invasion of Serbia, occupied the N.W. corner of the country from Shabatz on the N. to Liubovia on the S. The Serbian armies were under Marshal Putnik.

Putnik's first care was to cut off the Austrians in Shabatz from those farther S., and on Aug. 16, the former were routed at Belikamen. On the same day, however, the Serbians on the Tzer range, as well as on the Iverak hills, had been forced back by the Austrians.

On Aug. 17 Putnik took up a new line. On his extreme right he was feeling his way towards Shabatz, but found the position there too strong at the moment. Developing a combined movement against Tzer and Iverak with the left and centre of the 2nd army, he took the heights of Trojan and Parlog, victories which were somewhat offset by an Austrian advance on Iverak, and the continued pushing forward of the Kuprani force, in conjunction with a force from Liubovia, which threatened his left. On Aug. 18 the Austrians from Shabatz were defeated when trying to join up with their Tzer forces, who, that day, were driven from Kosanigrad, while their Iverak forces were held and then beaten at Yugovitchi and Velika Glava. Farther south the Serbians counter-attacked with success the Kuprani and Liubovia detachments. The Serbian victories on Tzer and Iverak were decisive on Aug. 19, when the Austrians retreated across the Drina. Putnik thereafter turned his attention to Shabatz, where the Austrians showed fight, but were defeated on Aug. 23, and evacuated the town next day. See Serbia.

Shackleton, SIR DAVID JAMES (1863-1938). A British Labour leader and administrator. Born at Nelson, Lancashire, he was educated at an elementary school at Haslingden, and began work in a cotton factory as a boy. In 1893 secretary of the weavers' association at Ramsbottom, in the next year he was transferred to Darwen. M.P. for Clitheroe in 1902, he was elected president of the Labour party 1905, and chairman of the T.U.C. 1908 and 1909. In 1910 Shackleton left parliament to

become senior labour adviser to the home office. In 1912 he was made an insurance commissioner. During 1916-21 he was permanent secretary to the ministry of Labour, being knighted in 1917, and having been its chief labour adviser, 1921-25, he retired in 1925. He died Aug. 1, 1938.

Shackleton, SIR ERNEST HENRY (1874-1922). British explorer. Born at Kilkeel, Ireland, Feb. 15, 1874,



Sir E. H. Shackleton, British explorer of the Antarctic

he was educated at Dulwich College, and entered the mercantile marine. In 1901 he was in the Antarctic Expedition under R. F. Scott (q.v.), and was secretary to the Royal Scottish Geographical

Society during 1903-06. He commanded the British Antarctic Expedition of 1907-09, which ascended Mt. Erebus, reached the south magnetic pole for the first time, and attained a point 97 m. from the South Pole itself. He also commanded the Antarctic Expedition of 1914-17, and in 1921 sailed from London at the head of the Shackleton-Rowett Antarctic Expedition in the Quest. Shackleton died of heart-failure, following influenza, on board the Quest at about 3.30 a.m. on Jan. 5, 1922, while his ship was at South Georgia (q.v.). His body was taken to Montevideo with the intention of bringing it to England, but on Feb. 3 it was announced it would be taken back to South Georgia and interred on that island. The expedition continued under Commander Frank Wild. Shackleton was knighted and appointed C.V.O. in 1909. He wrote *The Heart of the Antarctic*, 1909, and *South*, describing the 1914-17 expedition, 1919. There is a memorial to him on the Royal Geographical Society's building, Exhibition Road, London, S.W.7. See *Antarctic Exploration*; *Erebus*; *Quest*. Consult *Lives*, H. Bogle, 1922, H. R. Mill, 1923, F. Worsley, 1931.

Shad. Species of fish of the herring family. The *Allis shad* (*Alosa alosa*) is common about the coasts of Europe and often found in the lower reaches of rivers. It varies in length from one to two feet, and in appearance much resembles a large herring with a few black spots on the sides. The *twait* shad (*A. finla*) is more often found in southern waters.



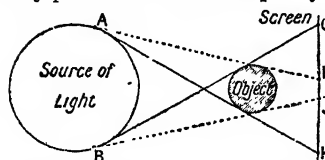
Shad. Common European variety, *Alosa alosa* or *Allis shad*

Shaddock (*Citrus decumana*). The older name for the green tree of the family Rutaceae, now better known as grape fruit (*q.v.*).

Shadoof. Water-raising device common in Egypt. Chiefly for distributing water from the Nile into irrigation channels, it consists of two wooden posts supporting a cross-bar, the latter carrying a beam with a weight at one end and at the other a bucket suspended from a length of palm stick. The water can thus be raised to a height of 8 ft., but in some parts of Upper Egypt as many as five shadoofs are required to raise the water in relay from low-lying rivers.

Shadow. In optics, phenomenon due to the cutting off of light by an opaque object. Shadows, by their formation, afford the simplest proof of the propagation of light in straight lines, for it is found that the edge of a shadow formed by a point of light, *e.g.* a pin hole in a dark shutter, is in a straight line with the edge of the object and the source of light. In order to find the form of a shadow cast by a point of light it is only necessary to draw lines from the source to the screen so that they touch the edge of the object.

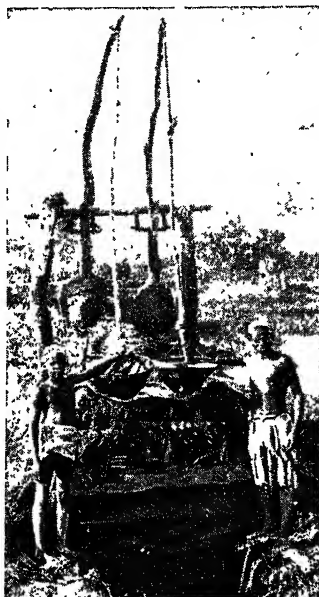
When, however, the source is not a point but a large body, there is no longer a simple black shadow with sharp outline. In the figure the light from a point A on the luminous source would throw the shadow of the object on to the screen at H K. Similarly the shadow cast by B would be G J. All intermediate points on the source would cast shadows between G and K. It will thus be seen that H J will be the only part of the screen completely



Shadow. Diagram explaining cause of the optical phenomenon. See text

in shadow, or completely cut off from the whole of the source of light. This part of the shadow is called the umbra. The rest of the shadow, the penumbra, is not completely dark, but gets darker from the outside to the edge of the umbra. The umbra and penumbra of shadows are important during eclipse of the sun by the moon. Observers in the umbra see a total eclipse or annular eclipse, and in the penumbra a partial eclipse.

If the shadow cast by an opaque object in the path of a beam of



Shadoof. An Egyptian contrivance for raising water from the Nile for irrigation purposes

light is examined microscopically the edge will be seen to be not absolutely sharp, and a series of light and dark bands will be observed near the edge. The corpuscular theory of light could not explain this so-called diffraction effect, which was one of the strongest points in favour of Fresnel's wave-theory.

Shadows exist in most forms of radiant energy, in the sense that they are spaces from which the energy has been cut off by interposition of some body. See Light.

Shadow Cabinet. Political term in Great Britain to describe a committee formed by the opposition party in the house of commons. It consists of the ministers who held office when their party was last in power, and, under the chairmanship of the ex-prime minister, acts as advisory committee to formulate party policy. The term was first used when the Liberal party went into opposition in 1923. The official title of the Conservative shadow cabinet is consultative committee.

Shadow Factory. Term introduced during the British rearmament programme in 1936 to describe munition plants which, although not in full production, could begin work at short notice. The term was used chiefly in relation to the aircraft industry, but makers of motor vehicles also built shadow factories for the production

of aero engines and armoured vehicles.

Shadwell. Dist. of E. London. Part of the parish and met. bor. of Stepney (*q.v.*), it is in the parl. div. of Whitechapel and St. George's. Its church of S. Paul, 1670-71, was rebuilt in 1820-21. Shadwell contains the East London hospital for children, 1868. A tunnel connecting Shadwell with Rotherhithe (usually called the Rotherhithe tunnel) was opened in 1908. Shadwell Basin forms part of the London docks.

Shadwell, ARTHUR (1854-1936). British scientist and writer. Born Sept. 21, 1854, he was educated at Uppingham and Keble College, Oxford, studied medicine at S. Bartholomew's Hospital, and practised at Brighton, 1883-87. Special correspondent to The Times in Russia and Germany during the cholera epidemic, 1892, he was cholera superintendent to the metropolitan asylums board, 1893. Later he devoted attention to social, economic, and industrial subjects, and wrote The London Water Supply, 1899; Drink, Temperance, and Legislation, 1902; Industrial Efficiency, 1906. In The Socialist Movement, 1925, and Typhoeus, or The Future of Socialism, 1929, he criticised Socialist ideas. He died March 21, 1936.

Shadwell, THOMAS (c. 1642-92). English dramatist. Born at Weeting, Norfolk, he studied at Caius College, Cambridge, and the Middle Temple. He wrote about 17 plays which, though inferior as drama, show an intimate knowledge of the London underworld of his day, and were remarkable for their censures of contemporary morals. Dryden, whom he had attacked, immortalised Shadwell in Mac-Flecknoe, or a satire on the True Blue Protestant Poet, T. S., 1682, and satirised him again as Og in Absalom and Achitophel. Shadwell, however, succeeded Dryden as poet laureate, and died Nov. 19, 1692. His works were edited by G. Saintsbury, 1925.

SHAEP. Abbrev. for Supreme Headquarters Allied Expeditionary Force. This was formed on Feb. 15, 1944, to direct Allied military operations before, during, and after the invasion of Europe, and remained in existence until July 13, 1945, when the Allied military govt. assumed control of defeated Germany. See Allied Expeditionary Force; D-day; Second Great War.

Shaft. In mechanics, a unit of a power transmission system, usually consisting of a round bar

of iron or steel, revolving in bearings. The revolving shaft may drive direct by means of belting, or have wheels or pulleys attached to it for the same purpose. Such shafts receive names according to their specialised work, e.g. propeller shaft. A countershaft is an intermediate between a main shaft from which it is driven and a machine to which it transmits motion. *See* Belt and Rope Drive; Crank; Motor Vehicle; *see also* Shaft-sinking.

Shaftesbury or SHASTON. Mun. borough and market town of Dorset, England. It is 28 m. N.W. of Dorchester and 103 S.W. of London, its nearest rly. station being Semley. The chief building is the church of S. Peter, a Perpendicular edifice; those of Holy Trinity and S. James are old foundations rebuilt. Shaftesbury is said to have been founded by King Alfred, and there was a Benedictine abbey here at an early date, in which Canute died in 1035. It became a borough, and from 1294 to 1885 was separately represented in parliament. In the Middle Ages Shaftesbury was a place of pilgrimage; today it is a centre of agricultural trade. Market day, Sat. (alternate). Pop. est. 3,400.

Shaftesbury, ANTHONY ASHLEY COOPER, 1ST EARL OF (1621-83). English statesman. He was born



1st Earl of Shaftesbury, English statesman
After Lely

July 22, 1621, at Wimborne St. Giles, Dorset, and educated at Exeter College, Oxford. In the Civil War Cooper, after serving in the royal army, joined the parliamentary forces, 1644. He sat in Barebone's and other Commonwealth parliaments, after 1655 in opposition. At the Restoration he was placed on the privy council, made Baron Ashley, and chancellor of the exchequer, 1661. He showed great diligence and ability, and was a member of the Cabal (*q.v.*).

In 1672 he was made earl of Shaftesbury and lord chancellor,

but espousing the popular cause of Protestantism, was dismissed, 1673, and joined the opposition. His violence led to his committal with Buckingham to the Tower, 1676, where he was confined two years until he submitted. Shaftesbury made use of the Popish Plot of 1678-80 to secure, among others, the judicial murder of his personal enemy Lord Stafford (*q.v.*). On the fall of Danby he became lord president, 1679, and carried the Habeas Corpus Act, but a proposal to exclude James from the succession in favour of Monmouth gave Charles the opportunity for his



Shaftesbury, Dorset. Gold Hill with the old wall on right

final dismissal. Attempts to foment rebellion brought him to the Tower again, 1681, and, being acquitted of treason by a Whig jury, Shaftesbury fled to Holland, 1682, and died at Amsterdam, Jan. 22, 1683. A man of great capacity and versatility, Shaftesbury was true only to his own interests. Dryden's Absalom and Achitophel describes his character. *Consult* Lives, W. D. Christie, 2 vols., 1871; H. D. Traill, 1886; L. F. Brown, 1934.

Shaftesbury, ANTHONY ASHLEY COOPER, 3RD EARL OF (1671-1713). English philosopher. Born in London, Feb. 26,

1671, son of the second earl, he was educated privately under the care of John Locke, at Winchester, and abroad, soon showing intellectual gifts of a high order, and giving much time to study. During 1695-98 he was M.P. for Poole, but his incursions into political life were intermittent. In 1699 he succeeded his father in the earldom, and he died at Naples, Feb. 15, 1713. His only son, Anthony, became the 4th earl.



3rd Earl of Shaftesbury, English philosopher

Shaftesbury's system of philosophy attracted the attention of Voltaire, Diderot, Leibniz, and other European thinkers. His ideas were set forward in various writings, especially his *Characteristics of Men, Manners, Opinions, Times*, 1711. This was republished, ed. J. M. Robertson, 1900.

Shaftesbury, ANTHONY ASHLEY COOPER, 7TH EARL OF (1801-85). English philanthropist. Son of the 6th earl, he was born April 28, 1801, and educated at Harrow and at Christ Church, Oxford. M.P. for Woodstock, 1826, Dorchester, 1830-31, and Dorset, 1831-46, he was made a lord of the Admiralty in 1834 and in 1851 succeeded to the earldom.

In 1828 he agitated for various reforms in the treatment of lunatics; in 1833 he turned his attention to mill-workers, and after many years obtained legislation introducing a ten-hour day and affording protection to children in the factories. In 1842 he succeeded in getting through a bill preventing women and children from working underground in mines. In 1846 he turned his attention to the Ragged Schools instituted for poor children, and was the chief instrument in extending their influence throughout the kingdom. Many kindred institutions also owe their existence to Shaftesbury. He died Oct. 1, 1885. *Consult* Life, by J. L. and B. Hammond, 1923; Noble Lord, B. Blackburn, 1949. In 1886 his grandson, also Anthony Ashley Cooper (b. Aug. 31, 1869), succeeded to the title as 9th earl. *See* Eros.



7th Earl of Shaftesbury, English philanthropist

Shaftesbury Society AND RAGGED SCHOOL UNION. Name taken in 1914 by the Ragged School (*q.v.*) Union of which the 7th earl of Shaftesbury (*v.s.*) was first president.

Shaft-sinking. Construction of deep wells for water supply and of vortical openings to give access to and ventilate mines and rly. tunnels. If the ground is firm and free from water they are usually of square section; but circular if they will be exposed to external pressure. Masonry and iron are commonly used for the lining. Where the ground is fairly dry the shaft is excavated and lined a section at a time. In waterlogged ground sinking may be done on the pneu-

matic caisson principle, and a segmental lining like that of a tube tunnel be used.

The Kind-Chaudron process of sinking through watery ground is as follows: A pilot shaft, 4 or 5 ft. in diameter, is drilled to firm ground with a large boring tool, and the shaft is then enlarged to full size with a similar tool of greater diameter guided by the pilot. The lining of segmental cast-iron rings is lowered from the top when the boring is complete, rings being added in succession. The bottom is closed by a diaphragm, through which a pipe is carried to the surface, and outside the lowest rings are an upper fixed and a lower sliding collar, with moss or oakum between them. The lining is thus converted into a huge plunger, sunk by allowing water to escape gradually through the tube. When the lining reaches bottom, the lower collar of the "moss-box" is forced upwards by the weight, squeezing the moss against the fixed collar and the ground outside the lining. The action is much the same as that of a patent pickle-bottle stopper or drain-plug. The space between lining and ground is filled in with hydraulic cement, and the water pumped from the interior. Shafts several hundred feet deep have been lined in this manner.

Quicksands are solidified by freezing the ground to be excavated with brine circulated in pipes sunk at intervals round the side of the shaft. Each pipe has a plug at the bottom, and contains an open-ended interior pipe. The brine is forced down through the small pipe and returned to the surface between it and the larger pipe. In the course of a few months the ground is frozen hard, and is kept in that condition while the shaft is excavated and lined. To thaw the ground, warm brine is circulated through the pipes.

The Joosten process is also used for the solidification of loose ground, such as ballast, gravel, and sands, by the injection of two chemical solutions, one after the other. This has the effect of forming a silica gel, and the free silicic acid generated during the process combines with the loose quartz particles, and binds the whole into a solid permanent mass, insoluble in water. Petrification is almost instantaneous. Several escalator shafts and tunnels of the London underground railway system have been constructed with the aid of chemical solidification. Compressed air has been successfully used.

Shag OR **GREEN CORMORANT** (*Phalacrocorax aristotelis*). British bird, common about the coasts. It



Shag or Green Cormorant. Small diving bird which frequents the British coasts
W. S. Berridge, F.Z.S.

is distinguished from the common cormorant by its smaller size and greenish plumage; and it spends less time on the rocks, besides being less numerous. It preys upon fish, which it catches by diving.

Shaggy Ridge. Name given by men of the Australian 7th div. to a spur of the Finisterre range, New Guinea. It lies c. 30 m. S. of Madang; 5,600 ft. high, it terminates in a conical peak named by the Australians the Pimple, which is 100 ft. higher. It dominates the upper Ramu valley through which the Australians were advancing against the Japanese in 1943 and, strongly fortified by the Japanese, had to be taken by frontal attack. After several days' bombardment of the ridge from the air the Australians stormed the Pimple, Dec. 27 (mid-summer), in torrential rains. Only near the crest of the ridge, so narrow in places that two men could not stand side by side, did they encounter resistance; but there savage hand-to-hand fighting continued until Jan. 21, 1944, before the Japanese were driven from Shaggy Ridge.

Shagreen. Untanned leather with a granular surface. The word is said to be derived from Turkish and Persian *saghri*, the back of a beast of burden, shagreen being made from the skin of the horse, ass, camel, and other animals. The characteristic surface is produced by pressing into the wet skin small seeds, which are removed when the skin is dry. Shagreen is also made from shark-skin. It is used for polishing wood and, usually dyed green, for sword and dagger-handles, horse trappings, small cases and boxes, etc. In the late

18th century it was a favourite material for covering watch cases. Many old Persian manuscripts are covered in shagreen. *Chagrin* is the French form of the word, used to denote vexation or mortification, from the grating nature of the material.

Shah. Title of the rulers of Persia. It is an abbrev. of *padshah*, lord king. The Turkish form is *padishah* (q.v.).

Shahabad. District of Bihar, India, in the Patna division. It is situated between the river Son and the Uttar union and S. of the Ganges. Rice, other cereals, and pulses are the chief crops. A third of the cultivated area is irrigated. Total area, 4,408 sq. m. Pop. 2,328,581.

Shahabad. Town of the Uttar union, India, in Hardoi district. It is situated on the N. border of the dist., 75 m. N.W. of Lucknow, on the rly. between Hardoi and Shahjahanpur. Pop. est. 24,000.

Shahabad. Town of Hyderabad, India. Situated about 300 m. S.E. of Bombay, it is noted for limestone quarries, the stone and cement from which are exported. It stands on a tributary of the Bhima and on the rly. between Raichur and Sholapur.

Shahapur. Town of India, in the former state of Sangli, Bombay state. It is the chief trading centre in the state, and dyeing silk is the principal industry. Pop. 13,000.

Shahjahanpur. District and town of the Uttar union, India, in the Ronilkhand division. The dist. stretches from the Ganges almost to the boundary of Nepal. Annual rainfall is 37 ins., and wheat, barley, and millet are the chief crops. Area, 1,770 sq. m. The town is a centre from which five rly. lines radiate, and has sugar factories and a rum distillery. Pop., dist., 983,385; town, 110,163.

Shah Jehan (d. 1666). Mogul emperor. Son of Jahangir, he fought bravely against the Rajputs



Shah Jehan,
Indian ruler

in 1614, but rebelled against his father in 1622. He was defeated in 1624 and pardoned, ascending the throne on Jahangir's death, 1627. His reign was one of constant warfare, but was signalised by an excellence of architecture unknown in India before or since. At Agra the Taj Mahal (q.v.) and the Pearl

Mosque were built by Shah Jehan, while the city of Delhi was founded by him. He made the Peacock throne, valued at £8,000,000, and captured by Nadir Shah, 1759. From 1658 Shah Jehan was imprisoned by his son Aurungzebe (*q.v.*) at Agra.

Sha-ho, BATTLE OF. Engagement of the Russo-Japanese War. Fought Oct. 7-17, 1904, it resulted from a Russian attempt to relieve Port Arthur (*q.v.*). The Russians opposed about 250,000 men to the 150,000 of the Japanese. Their plan was to move down the rly. from Mukden and endeavour to turn the Japanese right, and cut Japanese communications.

The advance began Oct. 4. On the night of Oct. 10 the opposing forces faced each other on a front of 40 m. from the Hun-ho on the W. to Pen-hsi-hu on the E. On Oct. 11 the Russian commander, Kuropatkin, strove to maintain his position on the Sha-ho river, while his left attempted the turning movement; but his troops were forced back on the right and centre. Next day the left was recalled and the Russians fell back toward the Sha-ho. On the 13th, pursuing Japanese drove them to the river, and by the 17th had forced them across to the left bank. Both sides then went into winter quarters on opposite banks of the Sha-ho, the Russians awaiting reinforcements, the Japanese awaiting the fall of Port Arthur before risking further attack. In this engagement the Russians lost over 40,000 men, the Japanese less than 20,000. See Russo-Japanese War.

Shahpur. District and town of Punjab, Pakistan, in the Rawalpindi division. The dist. lies W. of the Chenab, and is crossed by the Jhelum. The chief crops are wheat, millet, and cotton. Salt is obtained from the Salt Range at Warcha. The town lies E. of the Jhelum. Area, 4,770 sq. m. Pop., dist., 998,921; town, 10,400.

Shahpura. Town and former state of India, since 1948 part of Rajasthan. The state lay S. of Ajmer state on the E. side of the Aravalli Hills. Its area was 405 sq. m. Pop. 61,173. The town is 60 m. S.E. of Ajmer town. Pop. 9,600. The state was one of the first to decide to accede to the dominion of India in 1947.

Shahraban. Town of Iraq. Situated on the Diala river, where it breaks through the Hamrin Hills to the plain, it is about 50 m. N.E. of Bagdad, with which it is connected

by rly. During the First Great War it figured in the Mesopotamian campaign, and was occupied by the British in March, 1917. Here in Aug., 1920, six Englishmen and a handful of natives heroically defended the barracks during an Arab rising. Five were killed, including E. L. Buchanan, assistant irrigation officer. His widow was captured by the Arabs. She described the defence and her experiences in a book, *In the Hands of the Arabs*, published in 1921.

Shaikh OR **SHEIKH** (Arab., chief). Division of the Mahomedan community in India and Pakistan. The term now has little significance, as it has been so widely adopted by Muslims of all classes, and no special enumeration is made in the census. The title, properly denoting the spiritual leaders of the Sufi sect, should be confined to strict Muslims of Arab descent. The word is also used for a chief among the Arabs, but usually spelled sheik (*q.v.*).

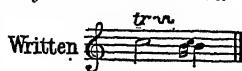
Shairp, JOHN CAMPBELL (1819-85). Scottish scholar, critic, and poet. Born at Houstoun, West



Lothian, July 30, 1819, and educated at Edinburgh Academy, Glasgow university, and Balliol College, Oxford, he was professor of Latin at, and eventually principal of, St. Andrews university.

In 1877 he became professor of poetry at Oxford. Among his works are *Kilmahoe*, 1864, notable for its beautiful lyric, *The Bush abune Traquair*, *Studies in Poetry and Philosophy*, 1868, *Culture and Religion*, 1870, *Burns*, 1879, and *Glen Dessaray*, 1888, another volume of poems. He died Sept. 18, 1885.

Shake OR **TRILL**. Musical ornament consisting of the rapid alternation of a note with that next above it in the scale. It is usually indicated by *tr.* (*tr. trillo*) and as a rule ends with a turn, which may or may not be written out.



The early practice was to commence the shake on the upper note, but for the last century it has

been customary to begin on the principal note, as above, and now when the older effect is desired the composer indicates it thus:



The performance of the shake in the 18th century was governed by very exact rules according to the nature of the passage.

Shakers. American religious society, founded about 1776 by Ann Lee (*q.v.*). An offshoot of the Society of Friends, they call themselves the Millennial Church or the United Society of Believers. Their religious worship originally included dancing and contortions of the body. They reject the use of the Sacraments, discourage marriage, and claim that true Christianity was never taught between the days of the Apostles and the rise of Mother Ann. Their buildings are bare and their dress plain. Their numbers are steadily decreasing, and only four small settlements remain. Their headquarters are at New Lebanon, N.Y., where they founded their settlement in 1787. An English sect of Shakers was founded in the New Forest in 1864 by Anno Girling (d. 1866), who claimed to be the incarnation of Christ.

Shakespeare, SIR GEOFFREY HITHERSAY (b. 1893). British politician. Educated at Highgate, and Emmanuel College, Cambridge, where he was president of the union, he entered politics in 1921, becoming secretary to Lloyd George. Called to the bar in 1922, he was National Liberal M.P. for Wellingborough 1922-23. After a spell in journalism he became, in 1929, Liberal M.P. for Norwich, continuing to sit as a Liberal National from 1931 to 1945. He was parliamentary under-secretary for the dominions, 1940-42. Created a baronet in 1942, he became a privy councillor in 1945.

Shakespeare, JOHN HOWARD (1857-1928). British divine. Born at Malton, he was educated at University College, London, and for the Baptist ministry at Regent's Park College. In 1883 he became a Baptist minister at Norwich, where he remained until 1888, when he was chosen secretary of the Baptist Union. He retired in 1924. Editor of *The Baptist Times*, Shakespeare was a prominent Nonconformist, being president of the Free Church Council in 1916. His books include *The Churches at the Cross-Roads*, 1918. He died March 12, 1928.

WILLIAM SHAKESPEARE

Sir Sidney Lee, D.Litt., Author of *A Life of William Shakespeare*

For details of Shakespeare's plays and characters see the articles under their respective titles, e.g. Hamlet; Macbeth; Falstaff; Juliet, etc. See Bacon-Shakespeare Controversy; Bankside; Blackfriars; Pytton; Globe Theatre; Leicester Square; Sholtery; Stratford-on-Avon; also Drama; English Literature

William Shakespeare was baptized in the parish church of Stratford-on-Avon, Warwickshire, April 26, 1564. He died April 23, 1616. His father, John Shakespeare, son of a farmer of Snitterfield, settled in Stratford about 1551, as a dealer in agricultural produce; he soon took an active part in municipal affairs, holding the office of bailiff, or mayor, in 1568-69; his wife, Mary Arden, was daughter of a substantial farmer of Wilmcote.

The dramatist was the third, but eldest surviving, child of the marriage. Of five younger children, three sons, Gilbert, Richard, and Edmund, and a daughter, Joan, reached maturity. William was educated at the grammar school of the town, and was soundly trained there in Latin literature. The dramatist left school in his 14th year. He is traditionally reported to have been "apprenticed to a butcher." At the end of 1582, when in his 19th year, he married Ann, daughter of Richard Hathaway, a farmer of Sholtery. Richard Hathaway's home is still preserved, and is known as Ann Hathaway's Cottage. Ann was Shakespeare's senior by eight years. A daughter, Susanna, was born within six months of the marriage, and twins—a son, Hamnet; and a daughter, Judith—early in 1585. The son died in his 12th year; the two daughters survived their father.

An Actor in London

In 1586 Shakespeare left his native town. Seventeenth-century tradition assigns the immediate cause to a threat of prosecution for poaching in the neighbouring Charlecote Park, belonging to Sir Thomas Lucy, whom Shakespeare ridiculed later as Justice Shallow. After a short experience as a country schoolmaster, Shakespeare reached London early in 1587. There he found humble employment in Shoreditch, at The Theatre, the only playhouse then existing. He was quickly admitted member of a company of actors, to which he remained faithful during the rest of his career. The successive patrons who gave their names in turn to Shakespeare's company were Queen Elizabeth's favourite, the earl of Leicester; the 4th earl of Derby; the 1st and 2nd Lords Hunsdon (both of whom held the office of lord chamberlain); and finally, after the death of Queen

Elizabeth, James I. King James, on May 19, 1603, issued letters-patent to Shakespeare and his colleagues, licensing them "freely to use and exercise the arte and facultie of playing." Thenceforth Shakespeare's company was commonly styled "The King's Servants," and took foremost rank.

With Kemp and Burbage

Throughout the winter and spring of each year, notably at Christmastime, the acting companies were summoned to perform at the royal palaces. As early in Shakespeare's career as Christmastide, 1594, he joined two eminent colleagues, William Kemp, the chief comedian of the day, and Richard Burbage, the chief tragedian, in rendering at Greenwich Palace "two several comedies or interludes" on St. Stephen's Day, Dec. 26, and Innocents' Day, Dec. 28, respectively. There is no evidence that Shakespeare went abroad, but there is reason to believe that he accompanied his colleagues on their tours at home.

Shakespeare played parts in Ben Jonson's earliest comedy, *Every Man in His Humour*, 1598, and in the same writer's tragedy *Sejanus*, 1603. In his own plays tradition reckons among his impersonations the Ghost in *Hamlet*, and Adam in *As You Like It*.

In London, Shakespeare first lodged in the parish of St. Helen's, Bishopsgate, but in 1596 he migrated to Southwark, which was soon the chief centre of theatrical activity. There he seems to have resided during the greater part of his subsequent London life, but in 1604 he "laye in the house" of Christopher Montjoy, a Huguenot refugee, who carried on the business of a "tire-maker" (i.e. maker of ladies' head-dresses) in Silver Street, Chapside.

Well before the opening of the 17th century, Shakespeare had gained an influential position in theatrical affairs. In 1598 he and three other fellow actors joined Richard Burbage and his brother Cuthbert in a speculation of great historic interest. The Burbages had, on the death, in 1597, of their father, the original founder, become owners of The Theatre in Shoreditch. In 1598 they, with the financial cooperation of Shakespeare and the other actors, leased a plot of ground near the Bank side

at Southwark, and transferred the fabric of The Theatre to the newly acquired site.

The re-erected playhouse was named The Globe, and with The Globe, which became the leading theatre of the period, Shakespeare was long identified. He acquired a tenth share in the property, which yielded handsome returns. Richard Burbage also inherited on his father's death the Blackfriars playhouse, but that theatre was leased by Burbage to others till 1608, when he presented Shakespeare with a seventh share. From Jan., 1610, onwards, the Blackfriars theatre was occupied by Shakespeare's company during the winter season, the rest of the year being spent by them at The Globe.

While faithful through life to the profession of actor, Shakespeare, like other players of his day, turned playwright early in his stage career, and rapidly gave proofs of a dramatic genius of unique quality. His powers of characterisation, his mastery of dramatic speech in both verse and prose, his philosophical temper, steadily grew more potent with his years, but from the outset he interpreted with poetic and dramatic insight the romantic no less than the comic and tragic phases of life.

Shakespeare's dramatic work was produced in the course of some twenty years, 1591-1611. Thirty-seven plays were assigned to his pen in his lifetime, but in the case of the three parts of Henry VI, Titus Andronicus, Taming of the Shrew, Timon of Athens, Pericles, and Henry VIII, he collaborated with others. Unprincipled publishers attributed to him in his lifetime six pieces with which he had no concern, and critics of acumen, solely on internal evidence, have since detected his hand in parts of Arden of Feversham, Sir Thomas More, and Edward III; while *The Two Noble Kinsmen* was originally published in 1634 as by Shakespeare and John Fletcher.

Early Work as Dramatist

Shakespeare's earliest dramatic efforts, produced in 1591-92, were three experimental comedies of varying types, *Love's Labour's Lost*, a social satire; *Two Gentlemen of Verona*, a romance qualified by drollery; and the farcical *Comedy of Errors*. He soon proved the breadth of his comic range in *The Merchant of Venice*, 1594, where comedy hovers on the brink of tragedy; in *A Midsummer Night's Dream*, 1594, where ethereal fancy mingles with romance and broad humour; in *All's Well That Ends Well*, 1596-97,

a pathetic romance rather unpleasantly developed; in *The Taming of the Shrew*, 1595-96, a farcical romance; and in *The Merry Wives of Windsor*, 1598, a domestic comedy.

In 1599-1600 he showed his matured hand as a writer of comedy in the romantic trilogy, *Much Ado About Nothing*, *As You Like It*, and *Twelfth Night*. In a different vein were Shakespeare's next so-called comedies, *Troilus and Cressida*, 1603, a story of woman's fickleness embedded in an impressive series of philosophic deliverances, and *Measure for Measure*, 1604, a study of sexual sin in a tragic vein. To *Pericles*, 1608, an ill-constructed romantic piece by an inferior hand, Shakespeare contributed a few scenes. Finally, Shakespeare, in *The Winter's Tale*, 1610, and *Cymbeline*, 1611, fused the separate types of comedy and tragedy into romantic tragic-comedy, and his latest comedy, *The Tempest*, 1611, is a vivid romance instinct with both poetry and philosophy.

Historical Plays and Tragedies

Meanwhile, Shakespeare applied himself no less successfully to tragedy, and to the dramatisation of the past history of his country. His first essay in history was a revision of the three parts of *Henry VI*, the early drafts of which were from the pens of Robert Greene and George Peele, with some help from Christopher Marlowe, who may be called Shakespeare's tutor in tragedy. Marlowe's influence is plainly seen in Shakespeare's earliest unassisted history plays, *Richard III* and *Richard II*, 1593. *King John*, 1594, though based directly on an older anonymous play, is rich in searching character studies, but Shakespeare's full-developed capacity as an historian-dramatist is seen in the two parts of *Henry IV*, 1596-98, which are rendered memorable by the unhistoric introduction of Falstaff, the supreme embodiment of Shakespeare's gift of humour. Shakespeare's endeavours in history were brought to a close in *Henry V*, 1598, a glorification of English heroism, which has a happy ending. In his latest years, Shakespeare aided his fellow-playwright, John Fletcher, in the loosely-jointed and pageant-like history-play of *Henry VIII*, 1611-12.

Shakespeare, in his earliest tragedy, *Romeo and Juliet*, 1592, the greatest of all tragic dramas of love, showed a master's youthful hand. Little of the Shakespearean touch is discernible in *Titus Andronicus*, 1593, a crude tragedy of

blood, and it was not until his genius was fully matured that he proved his pre-eminence in tragedy throughout its range. Between 1600 and 1609 he produced in quick succession those tragedies which rank above all others, of whatever age or country. After drawing a tragic plot from Roman history in *Julius Caesar*, 1609, he penned in 1602 *Hamlet*, which was followed by *Othello* in 1604, by *Macbeth* in 1606, and by *King Lear* in 1607. Then, having rendered some little aid to the halting author of *Timon of Athens*, 1608, he completed his great tragic series in two pieces based like *Julius Caesar* on Roman history, viz. *Antony and Cleopatra*, 1608, and *Coriolanus*, 1609.

It was as a writer of narrative poems—paraphrases of classical legends—that Shakespeare first caught the ear of the reading public. His *Venus and Adonis*, which he calls "the first heir of my invention," came from the press in 1593. *Lucrece* followed in 1594 and was received with equal favour. Both were dedicated in prose epistles to a young courtier of literary tastes, Henry Wriothesley, 3rd earl of Southampton. In 1599 William Jaggard issued a small poetic anthology which he misleadingly entitled "The Passionate Pilgrim, by W. Shakespeare." Only five of the twenty poems can be placed to Shakespeare's credit; two of them are sonnets, not previously published, and three are poetic extracts from the already published *Love's Labour's Lost*.

The Sonnets

The most important of Shakespeare's non-dramatic compositions are his Sonnets, which were not published till 1609, though both internal and external evidence shows that the majority of them, like the two which figure in *The Passionate Pilgrim*, were written at a far earlier date for circulation in MS. The Sonnets, which number 154, vary in poetic value. Many are the finest fruits of Shakespeare's poetic power; others sunk almost into inanity beneath the burden of conventional conceits, and echo the artificiality of the modish Elizabethan sonnet, which took its cue from Italy or France.

Thomas Thorpe, the original publisher, who habitually acquired dispersed MSS. as he could and published them without authority, dedicated Shakespeare's Sonnets (above his initials T. T.) in a conventional formula to a friend in the trade, "Mr. W. H., the onelie begetter [i.e. procurer] of these insuing sonnets."

With Thorpe's arrangement of the poems, the poet had small concern. Of the sonnets numbered by Thorpe i-cxxvi, some eighty are addressed in terms of deep affection to a young man. Twenty of these describe the youth as a patron of the poet's verse, and episodically complain that his favours have been for a time alienated by a rival poet. The young patron was, clearly, the earl of Southampton, to whom Shakespeare had already dedicated his narrative poems. The rival poet would seem to have been some obscure protégé of Southampton, in all probability Barnabe Barnes. Many of the later Sonnets (cxxvii-cxli) are addressed to a fickle, dark-complexioned mistress, who is represented as having intrigued with the poet's friend.

The Mary Fitton Legend

Like all great lyrics, the Sonnets convey the illusion of personal confession, but before the extent of their autobiographical veracity can be accurately gauged allowance has to be made for Shakespeare's unapproached dramatic power of interpreting objectively every phase of emotion, and for his assimilation of many predecessors' themes and turns of thought and expression. It is a futile fancy to seek the original of the "dark lady" in Mary Fitton or Fytton, a fair-haired mistress of the 3rd earl of Pembroke.

The steady development of Shakespeare's popularity as both poet and dramatist is well attested. As early as Sept., 1592, a rival playwright, Robert Greene, ran- rancorously described him as "an absolute *Johannes factotum* . . . and in his owne conceit, the onely Shake-scene in a countrey." More significant is the eulogy pronounced in 1598 by Francis Meres, a divine and schoolmaster, who declared, in his *Palladis Tamia* (*Wit's Treasury*), that "the Muses would speak Shakespeare's fine-fil'd phrase if they could speak English," and that "among the English he is most excellent in both kinds for the stage" (i.e. in tragedy and comedy). In witness of that statement Meres cited the titles of six comedies and six tragedies, together with his two narrative poems, and his "sugred Sonnets among his private friends," as yet unpublished. In Shakespeare's later days laudatory references to his work abound in contemporary literature. The tenor of such eulogy is finely elaborated in Ben Jonson's far-famed lines before the First Folio.

It is unlikely that Shakespeare, after his departure from Stratford

Mr. WILLIAM
SHAKESPEARES
 COMEDIES,
 HISTORIES &
 TRAGEDIES.

Printed according to the True Originall

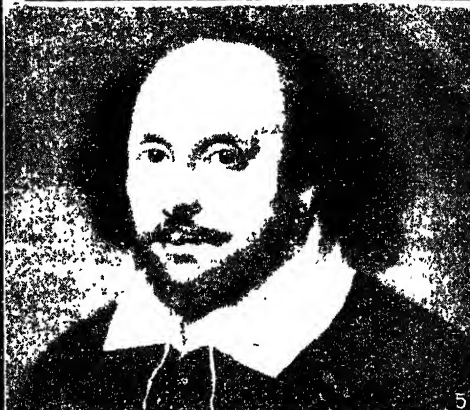


LONDON

Printed by Iamc Ioyard, and I'd. Blount. 1616



GOOD FREND FOR IESVS SAKE FORBEARE,
 TO DIGG THE DVST ENCLOSED HEARE:
 BLESSE BE Y^e MAN Y^e SPARES HES STONES,
 AND CVRST BE HE Y^e MOVES MY BONES.



William Shakespeare

1. Reduced facsimile of title page, First Folio, with Droeshout portrait.
2. Monument in Holy Trinity Church, Stratford-upon-Avon. 3. Inscription on grave.
4. Statue at Stratford-upon-Avon, presented by Lord Ronald Gower.
5. Chandos portrait. 6. Death mask, discovered at Mainz, 1849, now at Darmstadt.

SHAKESPEARE: PORTRAITS AND MEMORIALS OF ENGLAND'S SUPREME POET

in early manhood, revisited the place until 1596. During his absence his father's fortunes steadily declined. In 1596 an application to the Heralds' College was made in his father's name, but in his own behalf, for a coat-of-arms. A shield and crest were provisionally granted in the following terms: "Gold on a bend sable, a spear of the first, the point steeled proper, and for his crest or cognizance a falcon, his wings displayed argent, standing on a wreath of his colours, supporting a spear gold steeled as aforesaid." *Non Sans Droict* was the allotted motto. The grant was not finally confirmed until 1599. The arms are displayed with full heraldic elaboration on the poet's monument in Stratford Church.

Purchase of New Place

Shakespeare, as soon as his financial position in London was secure, acquired much property in his native place. On May 4, 1597, he purchased New Place, the second largest house in the town, although the poet did not regularly occupy it before 1611. Shakespeare's growing affluence was well recognized by his fellow townsmen, and they appealed to him in 1598 to use his influence in London in order to exempt the town from taxation. On Oct. 25, 1598, a local friend of the dramatist, Richard Quiney, who was in London on municipal business, wrote a pressing letter, asking for a loan of £30. This letter, which is preserved at Shakespeare's birthplace, is the only extant letter which was addressed to the poet.

The death of Shakespeare's father on Sept. 8, 1601, left Shakespeare owner of his birthplace in Henley Street. On May 1, 1602, Shakespeare purchased, for £320, a large plot of 107 acres of arable land near the town, to which he subsequently added 20 acres of pasture land. A larger investment was made on July 24, 1605, when Shakespeare bought, for £440, a lease of "a moiety of the tithes" (i.e. the tithe-estate) of Stratford.

Not until 1611, soon after the production of *The Tempest*, did he make Stratford his main home. Even then he paid frequent visits to London, where his financial interests in *The Globe* and Blackfriars theatres were undiminished. Early in 1613 he joined his friend and fellow-shareholder, the actor Burbage, in devising an heraldic emblem, technically known as an impresa (a symbolic vignette with motto), for the shield of Francis Manners, 6th earl of Rutland, which the earl bore at a great tournament held at Whitehall on

March 24, 1613. On March 10, 1613, he bought, for £140, a house with a yard attached, near the Blackfriars theatre. He left £60 of the purchase money on mortgage, signing a deed to that effect next day. Two years later, April 26, 1615, Shakespeare, with six other owners of adjoining Blackfriars property, brought a successful action in the court of chancery against a former owner for the recovery of the title-deeds.

Shakespeare's social circle at Stratford at the close of his life included all the better-to-do tradesfolk, as well as many of the country gentry. John Combe, a resident at Stratford, who owned much landed property in the neighbourhood, left him £5 on his death in 1614. Shakespeare took small part in local affairs, but an effort was made to draw him into local controversy in his last days, through the high-handed endeavour of John Combe's nephews, William and Thomas Combe (of whom the latter was his uncle's heir), to enclose in their personal interest the common lands of the town. Shakespeare, according to local records, preserved a strict neutrality. Ultimately, in 1618, after Shakespeare's death, the Combes suffered defeat.

In Jan., 1616, Francis Collins, a solicitor in good practice at Warwick, drafted Shakespeare's will, which was finally executed, after revision, in March. One of the five witnesses was Julius Shaw, bailiff or chief magistrate of the town. Early next month, according to the gossiping diary of John Ward, who was vicar of the town in Charles II's time, Shakespeare entertained at New Place two literary friends, Michael Drayton and Ben Jonson. The vicar suggests, unconvincedly, that at this "merry meeting" Shakespeare "drank too hard," for he "died of a favour there contracted."

The Tomb in Stratford Church

Shakespeare died at New Place on Tuesday, April 23, 1616, having just completed his 52nd year. Two days later he was buried in the chancel of Stratford Church, in front of the altar. In order to guard against the common practice of profaning graves by moving the bones soon after burial to the charnel house of the churchyard, Shakespeare directed the following lines to be inscribed on his tombstone:

Good friend, for Jesus' sake forbear
To dig the dust enclosed here.
Blest be the man that spares these stones,
And curst be he that moves my bones.

Well before 1623, a sculptured monument, enclosing within a central arch a half-length figure

of the poet, was affixed to the N. wall of the chancel, overlooking the grave. The monument was designed and executed by a well-known tomb-maker in Southwark. A panel below the dramatist's effigy bears the inscription:

Judicio Pylum, genio Socratem, arte
Maronem;
Tota legi, populus maeret, Olympus
haeret.

Stay passenger, why goest thou by so

fast?
Read, if thou canst, whom envious death
hath plast

Within this monument, Shakespeare with

whome

Quick nature dide; whose name doth deck

ys tombe

Far more than cost; sith all yt he hath

writ,

Leaves living art, but page to serve his

wit

Obit ano. dei 1616 Aetatis 53 Die 23 Ap.

The crude elegy acknowledges Shakespeare to be the greatest man of letters of his age, whom other living writers were only fit to serve as "page" or menial.

Shakespeare's Will

Shakespeare's will, the original of which is in Somerset House, was proved in London by the executors, his elder daughter Susanna, and her husband, John Hall, on June 23, 1616. The main part of the poet's estate was left to Mrs. Hall, with remainder to her issue in strict entail. Small legacies were left to the younger daughter, Mrs. Judith Quiney, and to the poet's sister, Mrs. Joan Hart, and her three sons. To his wife he left only "his second best bed, with the furniture" (i.e. the bedding). Recognitions of friends outside the family circle were numerous. His sword went to Thomas Combe, nephew of his friend John Combe, and seven suits of 26s. 8d. each, wherewith to buy memorial rings, were respectively allotted to four Stratford associates, and to three of his playhouse colleagues, Richard Burbage, the great actor who had created most of his tragic rôles, John Heminges, and Henry Condell; the two latter, though well known as actors, were mainly occupied in theatrical management.

In Shakespeare's lifetime there were printed separately in quarto his two narrative poems, *Venus and Adonis* (1st edit. 1593), *Lucrece* (1st edit. 1594), his *Sonnets* (1609), and fifteen plays, to which *Othello* was added posthumously in 1622. In 1623 thirty-six plays were issued collectively in the volume known as the *First Folio* (*Percules*, which had appeared in quarto, was excluded). This volume was undertaken by Shakespeare's friends and fellow actors, Heminges and Condell, who dedicated it to the brothers William Herbert, 3rd earl of Pembroke, lord chamberlain, and Philip, earl of Montgomery. Three brief panegyrics in verse

were contributed by little-known authors. But the most striking feature of the preliminary pages is a long eulogy by Ben Jonson, "To the memory of my beloved, the Author, Mr. William Shakespeare: and what he hath left us." There Jonson apostrophises Shakespeare as "Sweet Swan of Avon," whose dramatic genius excelled that of any dramatist of the ancient or modern world.

The Second Folio, published in 1632, includes among the prefatory verse Milton's famous epitaph: "What needs my Shakespeare for his honoured bones," etc. The Third Folio appeared in 1663; a re-issue in 1664 prints in an appendix Pericles, and six spurious plays which were erroneously attributed to Shakespeare by enterprising publishers in his lifetime. The Fourth Folio, dated 1685, reprints the 1664 issue of the Third Folio. The first attempt to edit Shakespeare's plays was made by Nicholas Rowe, in 1709, and his successors between that date and the present day have been legion.

Shakespeare was survived by his two daughters (Susanna, wife of John Hall, a medical practitioner of local repute, and Judith, wife of Thomas Quiney), and by Mrs. Hall's only child Elizabeth. His granddaughter, Elizabeth Hall, was his last direct descendant, and although she married twice, had no issue. Shakespeare's line only survives collaterally in the descendants of his nephew, Thomas Hart, the only married child of his sister, Mrs. Joan Hart.

Shakespeare's Handwriting

The sole extant relics of Shakespeare's handwriting that are of unquestioned authenticity are six signatures attached respectively to the following legal documents: a deposition dated May 11, 1612, in the law-suit Bellott v. Montjoy, now in the Public Record Office; the purchase deed, dated March 10, 1612-13, of the house in Blackfriars, now in the Guildhall Library, London; a deed dated March 11, 1612-13, mortgaging the Blackfriars house, now in the British Museum; Shakespeare's will, with his signature at the foot of each of the three sheets of paper, now at Somerset House. On the third and last sheet of the will the words "By me," in the dramatist's handwriting, precede the signature. Other alleged signatures appearing in the preliminary pages of books of the 16th or early 17th centuries may be regarded as fabrications. A recent attempt has been made, with doubtful success, to prove on

purely palaeographical grounds that a notable scene in an anonymous play, Sir Thomas More, which is extant in Brit. Mus. Harleian MS. 7368 (8a, 8b, 9a), is in Shakespeare's autograph.

No lifetime portrait of Shakespeare is known. Two were produced soon after his death, viz. the bust, a mechanical piece of sculpture, on the monument in Stratford Church, and the rather lifeless engraving by Martin Droeshout, on the title-page of the First Folio. Ben Jonson, in verses printed on a flyleaf facing Droeshout's print, declares "the graver" to have "hit" to perfection the poet's "face." The "Chandos" portrait in the National Portrait Gallery, although it was once the property of William D'Avenant, Shakespeare's reputed godson, is a fanciful version of Droeshout's engraving.

Portraits and Monuments

A portrait in the memorial gallery at Stratford, known as the "Flower portrait," has been claimed as the original painting on which Droeshout worked. It is probably of later date than the engraving, and based upon it. Other portraits, alleged to be of Shakespeare, by various artists of the 17th and 18th centuries, are very numerous, but of none has the authenticity been proved. A bust now in the Garrick Club, to which much historic interest has been assigned, is probably by Roubiliac, a French sculptor of the 18th century, whose full-length statue of the poet is in the British Museum. A monument with a statue, by Peter Scheemakers, after the Chandos portrait, was placed in Westminster Abbey by public subscription in 1741. Other statues have been erected in Leicester Square, London; at Stratford-on-Avon; in Paris; in Central Park, New York; in Lincoln Park, Chicago; and at Weimar. Sculptured memorials have been placed at Verona and in Southwark cathedral.

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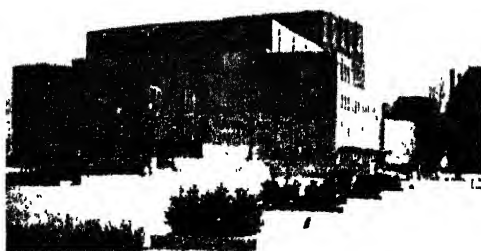
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Shakespeare Memorial Theatre. Theatre at Stratford-on-Avon where Shakespeare festivals are held annually. The first memorial theatre, built 1877-79, and standing in a pleasant riverside garden overlooking the Avon, was burnt down, March 6, 1926.



Shakespeare Memorial Theatre. Front view of the building at Stratford-on-Avon opened in 1932. It replaced a building destroyed by fire six years earlier

Archibald Flower, later knighted, then began a campaign for funds to build a new theatre, towards which £100,000 was given by John D. Rockefeller. The new building, constructed on the same site at a cost of £200,000 was opened April 23, 1932. Its striking design, by Elisabeth Scott, John Shepherd, and Maurice Chesterton, was for a time the subject of much controversy. The theatre can accommodate 1,258 people.

Shakespeare's Cliff. Precipitous cliff of chalk, 350 ft. in height, S.W. of Dover. The name preserves a supposition that it is the "steep" from which, in Shakespeare's King Lear, act 4, sc. 6, Gloucester seeks to destroy himself. Through the cliff runs a rly. tunnel, $\frac{3}{4}$ m. long. See Dover.

Shakhty. Town in the Azov-Black Sea region of the U.S.S.R. About 50 m. N.E. of Rostov, with which there is rly. communication, it is the centre of a coal mining area; the anthracite found here is 94 p.c. carbon. In July, 1942, the town was captured by the Germans, to be liberated Feb. 12, 1943. Its former name was Alexandrovsk-Grushevsk. Pop. 155,081.

Shaking Palsy. Disease occurring usually after middle life, characterised by tremor of the limbs. See Paralysis Agitans.

Shakuntala or **SAKUNTALA.** In Hindu legend, daughter of Visvama, and a water nymph. She was brought up by a hermit. King Dushyanta persuaded her to marry him. A son was born, who became founder of the Bharata dynasty. The drama on the subject by the ancient Indian poet Kalidasa was translated into English by Sir W. Jones, 1789, and by Sir M. Monier-Williams, 1856.

Shale (Ger. *schale*, shell). Laminated deposit of clay. Shales vary considerably in appearance and composition, and grade insensibly into sandstones or limestones, according as there is an increase in calcium carbonate, etc. They are found in all geological epochs from the Cambrian to the Tertiary. Some shales are highly refractory, and used in the manufacture of firebricks. Limestone shales are components of Portland cement, iron oxide shales are used in the manufacture of mineral paint, and shales containing alum in the manufacture of alum.

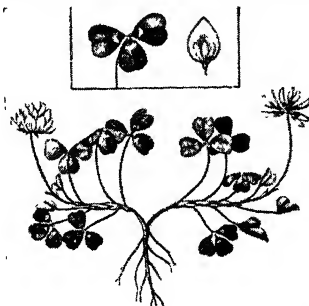
Bituminous shales or oil shales are sources of petroleum. In Scotland such rocks of Carboniferous age have been artificially heated and crude oil obtained from them.

The important oil reservoirs of the world are, however, the result of natural migration; the oil moves or is driven out of the shale into a more porous reservoir rock, whence it can be drawn off by a well. See Geology; Oil; Sedimentary Rocks.

Shalimar (Skt., abode, or hall, of love). Name given to a villa built, according to legend, at the N.E. corner of the Dal lake in Kashmir by Pravarsena II, founder of the city of Srinagar, who reigned in Kashmir from A.D. 79 to 139. The king often visited a saint named Sukarma Swami, living near Harwan, and rested in this villa on his way. The royal garden vanished, but a village which sprang up in its neighbourhood was called Shalimar. Another garden made on the old site in 1619 by the emperor Jehangir still remains. Shah Jehan, Jehangir's son and successor, built a Shalimar Bagh (garden) at Lahore on the model of his father's garden in Kashmir. A third Shalimar Bagh, now ruined, was built at Delhi by one of Shah Jehan's wives. Consult Gardens of the Great Mughals, C. M. Villiers-Stuart, 1913.

Shallot (*Allium ascalonicum*). Small bulbous-rooted member of the onion family. A native of Palestine, it was introduced to Great Britain about 1546. The bulbs are edible, and are usually pickled. Shallots are raised from bulblets, planted in a warm sunny bed or border in March, one foot apart every way. They are cultivated in the same manner as the onion (*q.v.*), omitting hardening the soil surface after planting.

Shallow. Character in King Henry IV, Part 2, who also appears in The Merry Wives of Windsor. A rustic justice of the peace, fond of descending upon his salad days in the inns of court, he is thought to be a caricature of Sir Thomas Lucy. See Shakespeare.



Shamrock. Plant of the species of clover adopted as an Irish national emblem. Inset left, leaf; right, flower

Shalmaneser. Name of five Assyrian kings. Shalmaneser I, about 1300 B.C., transferred the capital from Asshur to Calah. Shalmaneser III, formerly called II, 860-825, recounted on his black obelisk, now in the British Museum, 32 expeditions; it portrays Jehu and describes Hazael paying tribute (1 Kings 19). Shalmaneser V, 727-722, captured Hoshea and besieged Samaria (2 Kings 17). See Balawat; Karkar.

Shalott, THE LADY OF. Short poem by Tennyson. First published in 1832, it was much altered ten years later. The theme, taken from an Italian novelette, Donna di Scalotta, is of a magic mirror and the curse attached to it, and the versification is admired for descriptive effects.

Shamal. Name given to the prevailing N.W. wind which in summer blows over the plain of Iraq. During the day these winds are strong and carry much dust, but at night there is a lull. They are accompanied by cloudless skies and intensely hot, dry weather.

Shamanism. Form of spirit-worship developed in N. Asia. The Tungus name shaman denotes a medicine-man, whose soothsaying and exorcising are aided by ancestral ghosts or spirits.

The shaman cult, rooted in aboriginal Asia, and reminiscent of early Sumerian demonology, still prevails with the E. Siberian palaeasiatics and some lamaist Tibetans. The term is often applied loosely to N. American Indian spirit-worship.

Shamash. Babylonian and Assyrian sun-god. As son of Sin and brother of Ishtar, his worship, once centred in Larsa and Sippara, spread to Babylon and Nineveh. He is portrayed upon the stele bearing the Hammurabi code.

Shampoo (Hind. *chāmpnā*, to press). Friction, especially of the head, after washing in hot water. Originally, a shampoo consisted in gentle massage or kneading of the whole body by an attendant in the hot baths taken in the East. Now, the word is specifically used by hairdressers for a method of washing the hair with various preparations, and then rubbing and brushing it. In the "dry" shampoo washing with hot water is replaced by friction with a volatile essence. The preparations are now themselves commonly termed shampoos.

Shamrock, WHITE CLOVER, OR DUTCH CLOVER (*Trifolium repens*). Perennial herb of the family Leguminosae. A native of Europe, N. Africa, Asia, and N. America,

it has creeping stems, and the leaves are divided into three small heart-shaped leaflets, often with a curved whitish band near the base. The white flowers form a round head. According to some authorities wood-sorrel (*Oxalis acetosella*) is the shamrock.

Shamrock. In heraldry, the badge of Ireland. It is supposed to have been adopted by S. Patrick as an illustration of the Holy Trinity. It should have three heart-shaped lobes and a wavy stalk, thus differing from the trefoil, which has three pear-shaped lobes, and, if



Shamrock
in heraldry

"slipped," a straight stalk.

Shamrock. Name given by Sir Thomas Lipton to the yachts built by him to compete for the America Cup. They were numbered I, II, III, IV and V. See America Cup; Lipton, Sir T.

Shamyl (1797-1871). Caucasian patriot. Born in Daghestan, and elected imam in 1835, he led the Caucasian tribes in a long guerrilla war against Russia, thus assisting England and France during the Crimean War (1854-56). He was captured by the Russians at Cunib in 1859, and taken to Russia, where he lived in honourable confinement, but died while on a pilgrimage to Mecca.

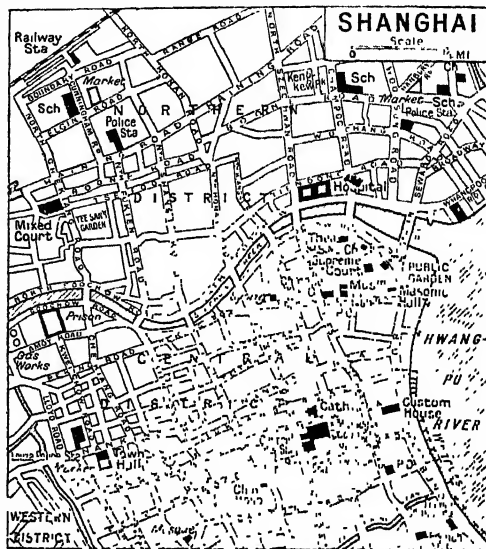
Shan. Burmese name for the people of the Burmese Shan State and S. China. Of T'ai (free) origin. The Shans entered Burma in the 13th century after the overthrow of their Nanchao kingdom (founded before the 7th century round Talifu) by Kublai Khan in 1253.

Like the Burmese they are Buddhists. The women dress as Burmese women do, but the men wear loose trousers and a bigger turban than do the Burmese. Often they wear a broad-brimmed bamboo hat. Short, hardy, light yellow, and straight-nosed, they are peaceable, keen traders, and skilful artisans.

The Shan states formerly under British rule numbered six northern states, with an area of 14,294 sq. m. and a pop. of 669,000, a mountainous dist. N.E. of Mandalay and adjacent to China; 37 southern states with an area of 40,434 sq. m. and a pop. of 927,000. Bounded by China and Siam, they are traversed by the R. Salween, and are not inhabited exclusively by Shans. They were separately administered, govt. by chiefs being maintained, and were formed into a federation, 1922, with a commissioner at its head directly answerable to the governor. Under the constitution of Burma from 1948, the federation, with the Wa states (pop. 82,614), became a part of the union of Burma as the Shan State.

Shangani. River of S. Rhodesia. It flows N.W. to the Gwai river, a S. tributary of the Zambezi. Here on Dec. 3, 1893, a small British force under Major Allen

Wilson was surrounded and killed by Lobengula's Matabele. Shangani station is 69 m. by rly. N.E. of Bulawayo, and stands at a height of 4,507 ft. above sea level. See Matoppos Hills.



Shanghai. Map of the European and business quarter of the important seaport of Central China

Shanghai. Seaport of China, in the prov. of Kiangsu. It stands 12 m. from the Yang-tse estuary on the tidal Hwangpu. Soochow Creek or Wosung river crosses the city, and the suburb of Pootung lies across the Hwangpu. Shanghai lies on the edge of a low, flat, and intensively cultivated area traversed by numerous small watercourses.

Shanghai was made a city in 1360, and the old part was surrounded by walls 3½ m. in circuit with 6 gates. The former European quarter lay N. of this city and occupied more than 9 sq. m. The former French concession, adjoining the Chinese city, dated from 1847, and the British concession N. of it was ceded in 1843 by the treaty of Nanking. What was formerly known as the American quarter lay within the British municipality. The streets of the commercial quarter are well kept, well lit, and contain many fine buildings in traditional Western styles including Trinity cathedral.

By the renunciation of extra-territorial rights in China by Great Britain (1943), the U.S.A., and other powers, the foreign concessions and the international settlement in Shanghai reverted to Chinese rule at the end of the Second Great War. The whole city



Shanghai, China. An aerial view of the city looking south along the busy Whangpoo river

and the surrounding area thus came under Chinese jurisdiction.

During 1925-27 there was considerable trouble in Shanghai, when British troops, with French and American marines, protected the international settlement. The British troops were withdrawn in 1928.

After their occupation of Manchuria in 1931, Japanese troops occupied Chapei, the district of Shanghai bordering the French concession. Fierce fighting took place between Chinese and Japanese for a year. During the China-Japan conflict, 1937-45, the invaders gained control of greater Shanghai in 1937. British troops were withdrawn in 1940, and on her entry into the Second Great War Japan occupied the international settlement. A British gunboat was sunk in the harbour by Japanese warships on Dec. 9, 1941. On April 24, 1942, Chinese guerrillas raided the port, damaging a power plant and the Japanese naval h.q., and in 1944 and 1945 military targets were attacked by U.S. aircraft. On Aug. 24, 1945, Chinese nationalist troops entered Shanghai. In the Communist drive of 1948-49, Shanghai surrendered May 27, 1949.

Normally Shanghai, with 6 m. of harbour, does nearly half the foreign trade of China. Much traffic passes up the Yang-tse, and there is rly. connexion with Hangchow, Nanking, and Peking. Navigable channels connect the port with the terminus of the Grand canal, 47 m. to the W., at Soochow. Winter conditions are pleasant, but the summer is trying. Snow falls in Jan. and Feb., and there is heavy rain in June. Pop. 3,489,998.

Shangri-la. Symbol of a desired home. This was the name of an imaginary monastery of Tibet in *Lost Horizon*, a novel by James Hilton, 1933, which was later filmed. Those who reached the place grew no older and were ideally happy. But any who returned to the outside world resumed their real ages and appearances.

Shankarsett, Jagannath (1800-65). Indian reformer. Born in Bombay of a Hindu family, he amassed a fortune in commerce, and devoted himself to the social and educational advancement of his countrymen. Among works for which he was responsible were the Bombay native institute, 1824, a Sanskrit college and library, and other educational establishments, and extensive improvements in roads, railways, and the town planning of parts of Bombay. He was nominated the first Indian

member of the Bombay legislative council in 1861. He died there July 31, 1865.

Shanklin. Urban dist. and holiday resort of the Isle of Wight. It is on the S.E. coast, 9 m. from Ryde, with a rly. station. It developed during the 19th century from a small fishing village nestling in the shelter of Shanklin Chine. The town is on the top of a cliff, from which



Shanklin arms

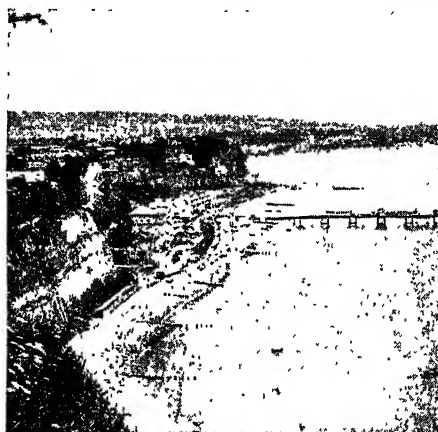
a steep road descends to the sea level esplanade. There are fine sands, stretching to Sandown and beyond, and a pier. Behind are the downs. Shanklin suffered from German "tip and run" raids during the Second Great War, most of the houses facing the esplanade being wrecked. The chief building is the Perpendicular church of S. John the Baptist. Pop. 5,071.

Shanks, Edward Richard Buxton (b. 1892). British writer. He was born in London, June 11, 1892, and educated at Merchant Taylors' and Trinity College, Cambridge, where he was editor of *The Granta*, 1912-13. After being invalided out of the army during the First Great War, he worked at the War office. His

earliest book of poems appeared in 1915, collected poems in 1926, and in 1919 he was the first winner of the Hawthornden prize. Assistant editor of the *London Mercury*, 1919-22, he became known as a literary critic, and later wrote novels, e.g. *Queer Street*, 1932; *Tom Tiddler's Ground*, 1934; *Old King Cole*, 1936. He produced critical studies of Poe, 1937, and Kipling, 1939.

Shannon. British warship famous for her encounter with the Chesapeake in the American War of 1812-14. A 38-gun frigate, she was commanded by Sir Philip Broke off the French and Spanish coasts, 1806-11. On June 1, 1813, she gave battle to the Chesapeake in Massachusetts Bay, and after fifteen minutes disabled the American vessel and took her prisoner to Halifax. See *American War*: Broke; Chesapeake.

Shannon. Longest river of Eire. It rises in Shannonpot, W. of Culecagh, Cavan, where the water emerges from an underground channel in the limestone rock. Thence it flows in a valley between the mts. of Culecagh and Benbrack to Lough Allen. From the lake it flows in general S. to the head of the Shannon estuary at Limerick, about 160 m. from the source. Below Lough Allen the course may be considered as composed of three reaches separated by Loughs Ree and Derg. The river falls 97 ft. in the 17 m. between Killaloe and Limerick. At Clondara there is connexion with the Royal Canal. From Limerick the estuary leads for about 70 m. almost due W. to the Atlantic Ocean; its width varies between 2 and 10 m. Below Limerick, where the river becomes



Shanklin, Isle of Wight. The cliffs, sea front, and pier, looking north

tidal, the fall is 144 ft. Vessels of 1,000 tons reach Limerick, and small steamers can get to Athlone.

The drainage area is 4,544 sq. m. Shannon salmon fishing is famous and profitable; trout fishing is not commercially exploited, except by owners of the river banks, who let sporting rights. Islands in the loughs show remains of religious institutions; most noteworthy on the banks are the seven churches of Clonmacnoise.

Use of the Shannon for hydroelectric power was projected when the Irish Free State was set up in 1921; work on the scheme began in 1924, the first stage being completed before 1930, but the second phase lapsed, the Second Great War preventing import of machinery. The work completed by the German firm of Siemens-Schuckert utilises the river fall between Lough Derg and Limerick in a race

head which leaves the Shannon at Parteen, above O'Brien's Bridge, and extends $6\frac{1}{2}$ m. to Ardacrusha. Here are installed three vertical turbines of 38,500 h.p. each. In 1946 the Irish electricity supply board announced that electricity produced in Eire amounted to 482 million units, 293 of them from the Shannon development scheme.

Shannon, CHARLES HAZLEWOOD (1863-1937). British artist. Born at Sleaford, April 26, 1863, he was trained at the Slade school. He soon attracted notice by his painting, romantic in feeling, marked by its graceful and flowing design and its rich and harmonious colour. An early member of the New English art club, he was elected A.R.A. in 1911 and R.A. in 1920. Shannon was also a lithographer. His works include *An Idyll*; *The Sapphire Bay*; *The Sleeping Nymph*. He died March 18, 1937.



Charles Shannon,
British artist

His first notable portrait appeared at the R.A. in 1881, and in 1887 he showed full powers with his painting of Henry Vigne. He became specially successful with women's and children's portraits. An original member of the New English art club, he became A.R.A. in 1907 and R.A. in 1909. He died March 6, 1923, having been knighted the previous year.

Shannon, SIR JAMES JEBUSA (1862-1923). An Anglo-American artist. Born at Auburn, N.Y., he came to England from Canada in 1878, and studied at S. Kensington, where he won the gold medal for figure painting. His first notable portrait appeared at the R.A. in 1881, and in 1887 he showed full powers with his painting of Henry Vigne. He became specially successful with women's and children's portraits. An original member of the New English art club, he became A.R.A. in 1907 and R.A. in 1909. He died March 6, 1923, having been knighted the previous year.

Shannon Airport. Irish airport. Situated 15 m. W. of Limerick, it comprises 800 acres, including the adjacent seaplane base and the former airport at Foynes. It is a landplane junction on the main trans-Atlantic air routes. In 1947 it became the first custom-free airport in the world. Its Irish name is Rineanna.

Shansi. Province of N. China. Touching Mongolia on the N., it covers 60,394 sq. m. and contains 105 counties, with Taiyuan its capital. Other cities are Tatung and Puchow. The Great Wall crosses the prov., which has for centuries been regarded as a strategically vital area, with its mt. passes. It is served by main rlys. Shansi has half the anthracite deposits of China; its iron ore industry is among the oldest in the

world; and it yields wheat, cotton, wool, and wine. There are many Muslims in a pop. of 11,601,000.

Shantung. Silk originally made in Shantung prov., China. It is produced by a wild silkworm, *Attacus Cynthia*, which feeds on the ailanto tree, and was introduced into Europe in 1857, where it fed on the castor oil plant. Originally shantung was a soft, undressed, undyed washing silk, but since 1907 processes have been perfected by which shantung can be bleached and dyed any colour.

Shantung. Maritime prov. of N. China, bounded N. and W. by Chihli (Hopei), S.W. by Honan, S. by Kiangsu, E. by the Yellow Sea. Here are the capital city Tsinan, the seaports Chefoo, Weihaiwei, and Tsingtao, Chufu the birthplace of Confucius, and Taishan the former sacred mt. There are excellent harbours, the lower course of the Yellow River, the Grand Canal, and good rly. communications. Coal and iron occur, wheat, cotton, peanuts, and silk (*v.s.*) are produced, and there are tanneries and match factories. Pop. 38,099,741, including many Muslims.

Shap. Market town and urban dist. of Westmorland, England. It is 12 m. S. of Penrith. The chief building is S. Michael's church, mainly 13th century. Granite is quarried in the neighbourhood, and cattle and horse fairs are held in the town. Four miles away is Shap Wells, where are a saline spring and an hotel. Shap Fell is the name of a neck of land between the Pennine Chain and the mts. of the Lake district, over which the rly. and the main road pass. Market day, Mon. Pop. est. 1,500.

Shapinshay. Island of the Orkney group, Scotland. It is 4 m. N. by E. of Kirkwall, and has an area of 11 sq. m. It is generally flat, the highest point being 162 ft., and is for the most part under cultivation. Pop. est. 500.

Shapka (Polish *czapka*, cap). Flat cap with a square crown, forming part of the national costume of Poland. From it was derived the typical cap formerly worn by the lancers of most armies, as the first lancer regiment formed as Napoleon's Polish Lancers (1807).

Share. An Anglo-Saxon word meaning part cut off, a portion. Shares and sharing are an important part of social activity. The

word share is particularly used in business to denote one of the parts into which the capital of a company is divided, e.g. a company might be registered with a share capital of £120,000, divided into 50,000 5 p.c. preference shares of £1 each, 50,000 ordinary shares of £1 each, and 40,000 deferred shares of 10s. each. Preference shares carry a prior right to be paid dividends, deferred shares give a right to participate in profits only after the claims of the owners of preference and ordinary shares have been satisfied. Those to whom shares are allotted are called shareholders or members of the company. When shares are fully paid they may be converted by the company into stock (*q.v.*).

Shares may be divided into three classes, according to the proof of ownership and the method of transfer. Inscribed shares (now rarely seen, but formerly general) are those the title to which consists in an entry in an official register; transfers are effected by the personal attendance of old and new owners or their agents. Registered shares (now most common in Great Britain) are those for which the company registrar maintains records of ownership, issuing a certificate of registration, usually termed a share certificate. Transfer of registered shares is effected by the shareholder executing a deed of transfer. Bearer shares are those for which the holding of a share warrant affords prima facie evidence of ownership. *See* Company Law; Debenture; Stock Exchange.

Shari or **CHARI.** River of French Equatorial Africa. It rises as the Gribingi, in the watershed about 100 m. N. of the Ubangi river, and runs N.W. to Lake Chad. The Shari forms, with the Benue route, the principal means of access to some districts of French Equatorial Africa. *See* Ubangi-Shari.

Shark. Group of primitive fishes with cartilaginous skeletons, of almost world-wide distribution, but most abundant in tropical and sub-tropical waters. The gills are in from 5 to 7 (usually 5) separate pouches, each with a distinct passage from the back part of the mouth, and a separate exit in the form of a vertical slit on the neck.

There are abundant teeth in several rows in each jaw. The Port Jackson shark (*Heterodontus philippi*) of Australia, which feeds upon molluscs, has flat, pavement-like teeth for crushing the hard shells; in others, feeding upon fish and crustaceans, the teeth are



Shapka, as worn
by Polish army
officers, 1945

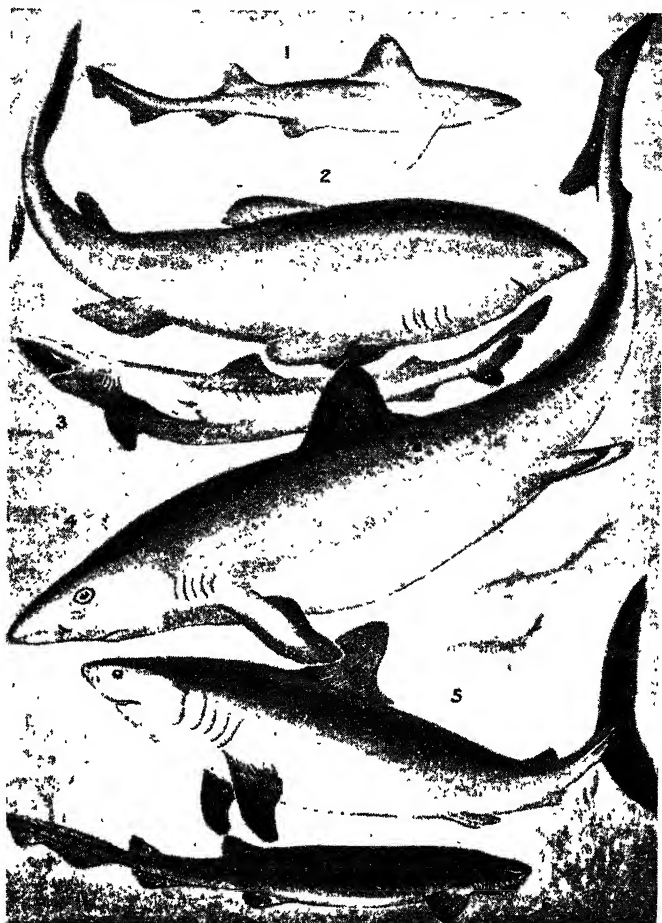
more or less triangular, with saw-like edges. The eggs are fertilised in the body of the female, for which purpose the male is provided with a pair of intromittent "claspers." In most cases the eggs are retained until they have hatched, but in the dog-fishes they are shed with horny capsules, which are attached to seaweeds. The majority are marine. A small species, *Carcharinus gangeticus*, of Indian rivers, has been found also in the Tigris and its ally, *C. zambesiensis*, 120 m. up the Zambezi; while *C. nicaraguensis* is found only in the Lake of Nicaragua.

The list of sharks found in the British seas includes as many as sixteen species, though among these are several that are either occasional or rare visitors; likewise the two common dog-fishes (*Scylliorhinus stellaris* and *S. caniculus*), which are not regarded popularly as sharks. Most remarkable of these visitors is the hammer-head (*Sphyrna zygaena*).

The blue shark (*Carcharinus glaucus*) of the Atlantic and Pacific is a regular summer visitor to the English Channel. The tope (*Eugaleus galeus*) is a regular inhabitant of British seas, where it feeds on fishes, crabs, and starfish; it is 5 or 6 ft. long, and dark grey above, paler beneath. The smooth hound (*Mustelus mustelus*), somewhat similar to the tope, is only about 3 ft., but it has the first back fin much nearer to the head than is usual in the tribe, and its teeth are of the kind that denotes a diet of molluscs.

The porbeagle (*Lamna cornubica*), about 10 ft. in length, has a deeper, more rounded body, with the large dorsal fin in the centre of the back, and the slender teeth long and tapering. It frequents both N. Atlantic and N. Pacific, visiting the W. coasts of the British Isles, and sometimes the E. coasts. The thrasher (*Alopias vulpes*), whose bluish coloration causes it frequently to be mistaken for the dangerous blue shark, is the commonest of the large British sharks; its food consists chiefly of herrings, pilchards and sprats. It is a regular visitor in the summer to the S. and W. coasts, where it sometimes gets entangled in nets. It reaches a total length of 15 ft., but more than half this measurement is accounted for by the extraordinary upper lobe of the tail, which it appears to use for rounding up herrings, etc.

Among occasional visitors to the British coasts may be mentioned



Shark. Principal species of the primitive fish. 1. Smooth Hound, 3-4 ft. 2. Greenland Shark, 26 ft. 3. Tope, 5-6 ft. 4. White Shark, 40 ft. 5. Porbeagle, 10 ft. 6. Nurse Hound, 4-5 ft.

also the black-mouth dog (*Pristiurus melanostomus*); the Greenland shark (*Sommiosus microcephalus*), 26 ft., which feeds on whales; and the spinous shark (*Echinorhinus spinosus*).

Notable sharks that are not British include the enormous but harmless whale shark (*Rhinodon typicus*) of the Indian and Pacific Oceans, whose length is 60 ft., but whose teeth are minute; the great white shark (*Carcharodon carcharias*) of the tropics, feared as a man eater; and the curious frilled shark (*Chlamydoselache anguineus*) of Japan, the Azores, and Norway, whose mouth at the extremity of the eel-like head, and the frilled flaps to the six gill clefts, establish a connexion with the more primitive fossil sharks. See Angel Fish; Basking Shark; Blue Shark; Dog Fish; Elasmobranchs; Fish; Hammer-headed Shark.

Shark Liver Oil. Red to brown oil rich in vitamin A, obtained from several varieties of shark.

Shark Bay. Inlet of the S. Indian Ocean in W. Australia. A narrow peninsula, Edsel Land, projects N.; off the N. end of it Dirk Hartog, Dorre, and Bernier Islands form a long chain extending N., all forming the W. side of the bay. The S. of the bay is divided into Freycinet Estuary and Hamelin Pool by Peron Peninsula. The Gascoyne and the Wooramel rivers enter the bay on the E. shore. The bay is a centre for the pearling industry.

Sharkiya or SHARQIYA. Prov. in Lower Egypt. It lies E. of the Nile delta, with a coast on Lake Manzala. Area, 1,933 sq. m. Pop. 1,355,362.

Sharon, PLAIN OF. Region of Palestine. Noted of old for its beauty and fertility, it lies between

the hills of Central Palestine on the E., and the Mediterranean on the W. It starts on the S. from Jaffa (Joppa), and reaches on the N. to Qisara (Caesarea), about 20 m. S. of Mt. Carmel. It is some 25 m. in length and 8 m. in width. The rose of Sharon, in Song of Solomon, chap. 2, was probably the narcissus. During the First Great War the Plain of Sharon was the scene of the infantry and cavalry advance of the British, which led to the conquest of Palestine.

Sharp. Sign used in music to denote the raising of a natural note by one semitone, thus : \sharp

In early days the sign for a natural was employed for the same purpose. The confusion thus occasioned was remedied towards the close of the 17th century by using a double, \times , or a single, \times , cross. The former was superseded by the present sign, and the latter (double sharp) now indicates that a natural is to be raised a whole tone. At one time sharp was used in Germany as synonymous with major, as when Beethoven described his Leonora overture no. 1 in C as being in C sharp. When a performer plays or sings a little above the true pitch, he is said to be "too sharp." See Flat; Harmony; Natural.

Sharp, BECKY. Character in Thackeray's novel *Vanity Fair*, of which she is the dominating personality. She typifies the heartless, self-seeking adventuress, with a peculiar power of fascination over widely different types of person. See Sedley, Amelia.

Sharp, CECIL JAMES (1859-1924). British musician. Born Nov. 22, 1859, he was educated at Uppingham and Clare College, Cambridge, held a legal post in Australia, 1883-89, and was principal of the Hampstead conservatoire of music, 1896-1905. He was



Cecil Sharp,
British musician

especially noteworthy as an indefatigable collector of English folk-songs and folk-dances. He died June 23, 1924. See Morris Dance. Consult Life, A. H. Fox-Strangways and M. Karpeles, 1933.

Sharp, GRANVILLE (1735-1813). British anti-slavery advocate. Born at Durham, Nov. 10,

1735, he was educated at Durham grammar school, and apprenticed to a London linen draper, afterwards obtaining an appointment in the government ordinance department. Sharp wrote some 60 pamphlets and books, but his important work was the defence of the negro slave, which after seven years' labour secured the momentous decision from the courts that "as soon as any slave sets his foot on English territory he becomes free." With Thomas Clarkson (q.v.) he founded the Association for the Abolition of Slavery, 1787. He died at Fulham, July 6, 1813. Consult Memoirs, P. Hoare, 1820.

Sharp, JAMES (1618-79). Scottish ecclesiastic. Born at Banff Castle, May 4, 1618, he was educated at King's College, Aberdeen, and at Oxford. He became professor of philosophy at St. Andrews, and in 1648 was ordained Presbyterian minister of Crail, Fifeshire. A prominent



James Sharp,
Scottish divine
After Lely

leader of the Presbyterian party, he was captured at Alyth in 1651, and imprisoned in the Tower of London until 1652. In 1660 he definitely crossed to the episcopal party, negotiated with Monk, and went to Charles II at Breda. In 1661 he was consecrated archbishop of St. Andrews, and became primate in 1664. His zeal in the establishment of episcopacy and his harsh treatment of the Presbyterians, whom he had formerly led, made him bitterly hated. His life was attempted in Edinburgh in 1668, and on May 3, 1679, he was brutally assassinated in his carriage on Magus Moor, Fifeshire.

Sharp, WILLIAM (1749-1824). British line engraver. Born in London, Jan. 29, 1749, he was apprenticed to Barak Longmate, a well-known heraldic engraver, and afterwards devoted himself to engraving works after Van Dyck, Guido, West, Reynolds, and others. Associated in his youth with Horne Tooke and Thomas Paine, he became in turn a disciple of Swedenborg and Johanna Southcott. He died at Chiswick, July 25, 1824.

Sharp, WILLIAM (1856-1905). Scottish man of letters. Born at Paisley, Sept. 12, 1856, and educated at Glasgow university he settled in London in 1878, and began to write. Among the products

of his pen were his poems *Earth's Voices*, 1884; *Romantic Ballads*, 1886; *Sospiri di Roma*, 1892; and novels and tales such as *The Children of To-morrow*, 1889; *Wives in Exile*, 1896; *Silence Farm*, 1899, besides biographies of the poets and other miscellaneous writings. His fame rests chiefly on the Celtic romantic tales which he wrote under the pseudonym of Fiona Macleod, such as *Pharais*, 1894; *The Mountain Lovers*, 1895; *Green Firc*, 1896; *The Winged Destiny*, 1904; and two plays, *The House of Usna*, 1900, *The Immortal Hour*, 1900; the last named was set to music by Rutland Boughton. The identity of Sharp with the supposed Highland prosopoeist, endowed with Celtic genius, and steeped in Celtic lore, though suspected in some quarters, was not revealed until after his death in Sicily, Dec. 14, 1905. A Memoir by his wife appeared in 1910.



William Sharp,
Scottish poet

Sharpsburg, BATTLE OF. Engagement in the American Civil War, sometimes called the battle of Antietam, Sept. 16-17, 1862. After his successful summer campaign, Lee crossed the Potomac with an army of 40,000, intending to invade Pennsylvania. On hearing of McClellan's advance from Washington he took up his position on the Antietam creek in front of Sharpsburg. Skirmishing began on Sept. 16, and the battle opened next day with a Federal advance which drove back Jackson on the Confederate left; after bitter fighting it seemed indecisive, but eventually it proved a Federal victory by forcing Lee to abandon his Pennsylvania campaign and retreat to Virginia. The losses on either side were heavy. Of 75,000 men engaged on the Federal side, 12,000 became casualties; the Confederates lost 11,000 men.

Sharpshooter. Word formerly used for a soldier specially employed as a marksman in time of war. The modern equivalent is sniper. Sharpshooters were often organized in regts., and were prominent in the war of American Independence. See Sniper.

Shasi. Town in Hupeh province, China. Standing on the Yang-tse river, 882 m. from the mouth, it was opened as a treaty port in 1896. Shasi dates from before the Christian era, but was

entirely destroyed in the 13th century. A large embankment protects the town from the river floods. Here much cotton cloth is manufactured. Pop. 110,590.

Shasta, Mr. Extinct volcano of California, U.S.A. It rises to 14,380 ft. in the Sierra Nevada. The summit is snow-clad, and small glaciers lie on the N. slope. A large crater, $\frac{2}{3}$ m. across and 2,500 ft. deep, is 1,400 ft. below the top.

Shasta Dam. Irrigation, flood control, and hydro-electric power dam across the Sacramento river, Calif., U.S.A. This key structure of the Central Valley project was completed in 1945, and has a maximum height of 602 ft. and is 3,500 ft. long, 6,413,000 cu. yds. of concrete being used. Twenty-five p.c. of the water impounded irrigates 255,000 acres in the Sacramento valley, while the remainder operates generating plants with a capacity of 379,000 kW.

Shatt-al-Arab. The "river of Arabia." Formed by the junction of the Euphrates and the Tigris, near Kurna in Lower Iraq, it flows down from the N. past Basra into the Persian Gulf, after receiving the waters of the Karun from the N.E. It is about 100 m. long, its width averaging about 600 yds.

Shatt-al-Hai. River of Iraq. It flows out of the Tigris at Kut-el-Amara on the N., and joins the Euphrates at Nasrieh on the S. About 150 m. in length, it has a town on its banks called Hai, 20 m. S. of Kut, and is navigable for small native craft for some distance for four or five months of the year. It is subject to floods. It was prominent in the operations for the capture and relief of Kut in the First Great War. See Kut; Mesopotamia Campaign.

Shavli. Lithuanian town whose name is also spelt Siaulhai (*q.v.*).

Shaw. Market town of Lancs, England, which comes within the urban dist. of Crompton. It stands on the Beal, 3 m. N. of Oldham, with a rly. station. The principal buildings are Holy Trinity church and the town hall. The chief industry is the manufacture of cotton goods. Market day, Thurs. Pop. 12,530.

Shaw, ALFRED (1842-1907). English cricketer. Born Aug. 20, 1842, at Burton Joyce, near Nottingham, he was apprenticed to a hosier, but secured an appointment with a cricket club at Grant-ham as a professional. In 1864 he joined the ground staff at Lord's and began to play regularly for Notts. For about 20 years from



Alfred Shaw,
English cricketer
Russell

1867 Shaw was at the top of his powers, and was perhaps the greatest bowler in England, certainly the greatest slow bowler. He played for England in seven test matches against Australia, going there five times and twice to America. He died Jan. 16, 1907.

Shaw, SIR EYRE MASSEY (1830-1908). Chief of the London metropolitan fire brigade. Born Jan. 17, 1830, he graduated at Dublin university and then entered the army, but retired in 1860, upon appointment as chief constable of Belfast. There he reorganized the fire brigade so efficiently that in 1861 he became chief of the London fire brigade.



Sir E. M. Shaw,
Chief of London Fire
Brigade

During his 30 years of office he introduced numberless improvements and entirely remodelled the brigade. On his retirement, 1891, he was knighted, and later became chairman of the Metropolitan Electric Supply company. He died Aug. 25, 1908. Shaw wrote books on fighting and preventing fire. He was the Captain Shaw apostrophised in Iolanthe as "type of true love kept under." The firefloat kept moored on the Thames is named after him. See Firefloat; Fire Service.

Shaw, FLORA LOUISE (d. 1929). British journalist. Wife of Lord Lugard (*q.v.*), she was head of the colonial department of The Times from 1890 to 1902. A strong believer in Rhodes, she had a considerable influence on the S. African policy of The Times, for which she undertook special missions to S. Africa, Australia (where she investigated the use of Kanaka labour in the Queensland sugar industry), and Canada. During the First Great War she founded the Lady Lugard hospitality committee and received the D.B.E. Among her books the most noteworthy was A Tropical Dependency, 1905. She died Jan. 25, 1929.

GEORGE BERNARD SHAW

Hesketh Pearson, author, *Bernard Shaw, His Life and Personality*

An outline of the career of one of the outstanding literary figures of the 20th century, dramatist, sociologist, critic, and famous public character. His most important plays are noticed separately under their own headings

Born in Dublin on July 26, 1856, Bernard Shaw went to several schools, learning nothing at any of them, but educating himself in music, literature, and painting. His sense of humour was derived from his father, his love and knowledge of music from his mother. Having wasted some years in a land agent's office, at the age of twenty he joined his mother in London, where she had gone to teach singing, and spent the years 1879-83 writing five novels at her expense. Each was sent to every publisher in London, and each was rejected. He detested all of them, and was ashamed of them when they were published some time after his reputation had been made as a critic and a dramatist.

But the drudgery of composition taught him how to write, and they reveal the phases of his mental development. The first two, *Immaturity* and *The Irrational Knot*, show him as a rationalist, a materialist, and a freethinker. The third, *Love Among the Artists*,

abandons rationalism and plunges into the conflict between aesthetic genius and common sense; it contains not a little of the playwright-to-be. The fourth, *Cashel Byron's Profession*, which later became a best-seller, displays his interest in boxing, including its economics, and was written for fun. The fifth, *An Unsocial Socialist*, is the first fruit of his reading of Karl Marx and complete conversion to socialism. But this premature attempt to grapple with the whole social problem convinced him that he was unequipped for the task; and he gave it up after two unbearably long chapters. The book we have is merely a scrap of fiction covering an aborted attempt at a treatise.

In 1881 Shaw, still only an ardent Shelleyan politically, became a vegetarian, and as he never drank alcohol and never smoked, his time and vitality had to be expended in other directions. Though nervous and shy by nature, he forced himself to speak in public; and having become

interested in economics by hearing Henry George, and converted to socialism by reading Karl Marx, he joined the Fabian Society in 1884, and with Lord Passfield (then Sidney Webb) initiated its work of "taking socialism off the barricades" and making it practical, respectable, and constitutional. As its missionary he took part in all the social agitations of the period, including "Bloody Sunday" in Trafalgar Square (1887), and soon won fame as a first-rate speaker and a superb debater, at first in the open air and among working-class audiences in free seats in the East End, but finally as a star orator drawing fashionable paying audiences in the central halls, a change so little to his taste that his later appearances on the platform, lucrative for his hosts (he never lectured professionally), were rare and occasional.

Meanwhile, he and Sidney Webb forced the Liberal party to adopt the Newcastle programme of Fabian Socialism and win the 1892 election on it. On its repudiation when it had served its turn Shaw and Webb issued two tracts, *To your Tents, O Israel*, and *A Plan of Campaign for Labour*. The result was the formation of the Labour Party and its establishment in parliament in 1906.

"Corno di Bassetto"

Helped by William Archer, Shaw started to earn his livelihood in 1885 as a critic of books for *The Pall Mall Gazette* and of pictures for *The World*; but his reputation was made as a critic of music for *The Star*, under the pseudonym of "Corno di Bassetto," from May, 1888, to May, 1890, and consolidated between 1890 and 1894 as music critic to *The World*, when the initials G.B.S. first delighted the reading public and infuriated the orthodox. This was followed by three years as theatre critic to *The Saturday Review* (1895-98).

In his critical work Shaw was classical, but irreverent and extremely readable. He knocked some popular idols off their pedestals and set up his own in their place. He never pontificated unless and until he knew, and then did so with apparent levity, making his most deeply considered judgements read like the sallies of a buffoon. He hated slovenly work of any description and was not mild in his censure of it. He attacked Shakespeare's plays, which he loved, because everyone else was absurdly uncritical of

them and glorified the mutilated versions produced by Henry Irving; and he paved the way for a proper understanding in England of Ibsen and Wagner, of whose works he wrote appreciations: *The Quintessence of Ibsenism* and *The Perfect Wagnerite*. He may be claimed as the most individual, provocative, and amusing critic in the English language.



G. Bernard Shaw

Meanwhile he had been making his first experiments in play-writing. The earliest, a tragicomedy of slum landlordism called *Widowers' Houses*, was produced by the Independent Theatre on Dec. 9, 1892, and had a mixed reception; the next, *The Philanderer*, a satire on the Ibsenites, remained unacted for many years; while the third, *Mrs. Warren's Profession*, dealing with immoral earnings, outraged the conventions of that time and was censored, though it silenced the critics who had slighted him as a pamphleteer who was mistaking his vocation. He then turned his

attention to more agreeable topics, writing *Arms and the Man*, *Candida*, *You Never Can Tell*, and *The Devil's Disciple*, all of which provided the backbone of the English repertory movement in the early decades of the 20th century. In Germany and America two of them proved box-office successes, and enriched their author sufficiently to justify him in marrying Charlotte Payne-Townshend in 1898. Following this, in spite of a breakdown in health, he produced one of his greatest works, *Caesar and Cleopatra*, which, by initiating a natural and humorous treatment of historical subjects, has influenced subsequent drama and biography.

Fame as a Playwright

During 1897-1903 he served first as vestryman and then as borough councillor for St. Pancras. In the latter part of this period he wrote *Man and Superman*, which contains the essence of his faith as an evolutionist, his belief in a creative purpose, all living creatures being experiments in the production of instruments of that purpose, which is the attainment of power over matter and circumstance with the necessary accompanying knowledge and comprehension. His fame as a playwright was firmly established during the Vedrenne-Barker season at the Court Theatre (1904-07), where John Bull's Other Island, *Man and Superman*, *Major Barbara*, *The Doctor's Dilemma*, *Captain Brassbound's Conversion*, and earlier plays were performed. The West End managers now clamoured for his work, and big successes were scored with *Fanny's First Play* and *Pygmalion*; though *Androcles and The Lion* (1913), "a pantomime for children of all ages," his finest comedy, was funny enough to be misunderstood.

In the 1914-18 war, when Shaw, to avert hostilities, proposed the foreign policy afterwards adopted at Locarno, his objective and critical Irish view of British diplomacy, jarring on British patriotism, made him unpopular for a while; but his sanity and the inevitable ebb of the war excitement enabled him to weather the storm. During the conflict he wrote *Heartbreak House* and began *Back to Methuselah*, which was his testament to the human race, his main achievement as a prophet. His career as a playwright was crowned with *Saint Joan* (1923), which, with *Caesar and Androcles*, will probably out-

last his modern sociological plays. After that he spent three years writing *The Intelligent Woman's Guide to Socialism*, which contains his economic doctrine, much of it already set forth in the prefaces to his various works. The most successful of his later pieces for the theatre was *The Apple Cart*, produced in 1929 at the first Malvern Festival, inaugurated by Sir Barry Jackson in his honour. It should be added that Shaw produced his plays, and supplemented the film versions of them. The popularity of the latter, coupled with his success as a broadcaster, made him famous from the Arctic to the Antipodes.

In 1925 Shaw was awarded the Nobel prize for literature. An offer of a peerage was refused, and the Order of Merit was rejected as superfluous on the ground that he had already conferred it on himself. This was perfectly true. As a playwright he stands next to Shakespeare in English literature, having overthrown the dominance of the British drama by the French system of "constructed" plays and restored dramatic subject matter to its ancient classical universality, upsetting all the conventions of what a "well-made" play should be, attacking current morality, and introducing politics, religion, and science to a form of entertainment that had previously dealt chiefly with crime, adultery and pseudo-romanticism.

As a critic he is more versatile and entertaining than his predecessor G. H. Lewes, and lighter in hand than Hazlitt. As a thinker he had a greater effect on his age than any other writer. As a reformer he and his fellow-Fabians created a new political force in England. And as a man he showed that singleness of purpose and undeviating sincerity can be united with genial toleration and unflinching gaiety.

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Shaw, HENRY WHEELER (1818-85). American humorist known by his pen-name Josh Billings (*q.v.*).

Shaw, JOHN BYAM LISTON (1872-1919). British artist. Born at Madras, India, Nov. 13, 1872, he was taken to England in 1878, and studied art at the St. John's Wood and the R.A. schools. As a painter with a taste for brilliant decorative colour, he achieved success, but his reputation depends equally on his black-and-white work, particularly his illustrations to the Chiswick Shakespeare. He died Jan. 26, 1919.

Shaw, MARTIN FALLAS (b. 1875). English musician. Born in London, he had his musical education at the Royal College of Music under Stanford. He toured the Continent as musical director to Isadora Duncan during 1906-08, and later occupied various posts as organist, being master of the music at St. Martin-in-the-Fields, 1920-24. He edited much music, *e.g.* Songs of Britain, Songs of Praise (in collaboration with Vaughan Williams), and the English Carol Book. He composed choral settings of poems by John Massfield, Laurence Binyon, and T. S. Eliot.

Shaw, RICHARD NORMAN (1831-1912). British architect. Born in Edinburgh, May 7, 1831, he was articled to an architect in London. Studying at the R.A. schools, he won a medal and a studentship, and in 1863 began to practise on his own account.

He soon made a reputation by his country houses, one of which was Lord Armstrong's residence, Cragside, but is also known as the architect of New Scotland Yard (*q.v.*), the Piccadilly Hotel, and other London buildings, as also of houses on the Bedford Park estate. R.A. in 1877, he died Nov. 17, 1912.

Shaw, THOMAS (1872-1938). English politician. He was born at Colne, Lancs, April 9, 1872, and worked in a cotton mill when young. He took a prominent part in the trade union movement, and became in 1911 secretary of the international federation of textile workers, a post which he continued to hold for many years. M.P. for Preston, 1918-31, he was minister of Labour in 1924, and war secretary 1929-31. Tom Shaw died Sept. 26, 1938.

Shaw, SIR (WILLIAM) NAPIER (1854-1945). A British meteorologist. He was born in Birmingham, March 4, 1854, and educated

at Emmanuel College, Cambridge, of which he was a fellow, 1877-1906, and senior tutor, 1890-99. In 1879 he studied under Helmholtz in Berlin and in 1898 became assistant director of the Cavendish laboratory, at which, in 1877, he had been one of the first research workers under Clerk-Maxwell. As director of the meteorological office, 1905-20, Shaw did much to raise British prestige in international meteorology. Towards the end of the First Great War he acted as scientific adviser to the govt. He was knighted in 1915. On retirement he was appointed first professor of meteorology in London university, 1920-24. F.R.S., 1891, he was awarded a royal medal in 1923. His original contributions to science were considerable, but he is best known as the author of a *Manual of Meteorology*. He died in London, March 23, 1945.

Shawcross, SIR WILLIAM HARTLEY (b. 1902). British lawyer and politician. Born in Germany, Feb. 4, 1902, he was educated at Dulwich and at Geneva. Called to the bar, 1925, he was lecturer in law at Liverpool university, 1927-34, during which time he practised on the northern circuit.

In 1939 he became a K.C. He was chairman of the enemy aliens' tribunal, 1939-40, recorder of Salford, 1941-45, and in 1945 became Labour M.P. for St. Helens. In the same year he became attorney-general. At Nuremberg trials he was chief prosecutor for Great Britain; he also prosecuted at the trials for treason in London of William Joyce and Norman Baillie-Stewart; and took part in the proceedings of the Lyskney tribunal, 1948. He became recorder of Kingston-upon-Thames the same year. Knighted in 1945, he was made a privy councillor in 1946.

Shawinigan Falls. City of Quebec, Canada. It stands on the St. Maurice river, 21 m. from Three Rivers, and is important because the falls, 150 ft. high, here generate 200,000 h.p. It is on the C.P.R. and the C.N.R. Its manufactures are connected with the pulp, aluminium, carbide, and lumber industries. Pop. 24,750.

Shawl (Pers. *shāl*). Square of material worn draped from the



Norman Shaw,
British architect



Sir W. Hartley
Shawcross,
British lawyer
and politician

shoulders. A garment of great antiquity and wide distribution, the best shawls are those of Kashmir, which, with their characteristic cone pattern, fine quality, and beauty and depth of colour, have gained wide fame. The fine under-hair of the shawl goat, called pashm, is used, and the process of weaving after the thread has been made and dyed is long.

Some of the finest shawls cost in Kashmir itself as much as £300, though those of simple design and few colours may be as low as £15 or £16. Shawls of an inferior kind, but also made of pashm mixed with other wool, are manufactured at Amritsar, Jalalpur, and other places in the Punjab, where artisans from Kashmir have emigrated.

Early in the 19th century the fashion for wearing shawls arose among women in Europe, and the demand for them was such that large manufactures sprang up to cope with it, notably in France and Austria, while the shawls of Paisley in Renfrewshire, imitating those of Kashmir, became famous.

Shawm (Fr. *chalumeau*, from Lat. *calamus*, a reed). Double reed instrument like the oboe, but having a larger conical bore and a wider bell. It is of ancient origin, a similar instrument being known to the Romans. It became extremely popular from about the 12th century. In England it formed a part of the king's household band, and was also much used by the watchman or waits, whence it was known as the wayte pipe. Like other instruments of the 16th and 17th centuries, the shawm was made in various sizes from treble to contra-bass, the illustration being of the latter. Each had a compass of about an octave and a half. The shawm was eventually superseded by the oboe, but the treble pipe is still used in conjunction with the bagpipe by wandering minstrels on the Continent. The word shawm in the Prayer-book version of the Psalms is a mistranslation of the word Shofar (*q.v.*).

Shea Butter. Lard-like substance extracted from the seeds of *Bassia parkii*. See Butter-tree.

Sheaf. River of Derbyshire and Yorkshire, England. It rises in the Peak district of Derbyshire and for about four miles separates that county from Yorkshire. It falls into the Don at Sheffield.

Shear. In mechanics, the kind of strain produced in a substance by pressure, in which successive layers of the substance slide over one another laterally. In riveted joints, for example, sideways pressure may cause the rivets to part as if cut by shears. The strain produced by a shearing stress is also termed shearing. See Strain; Stress.

Shearer, NORMA (b. 1904). Canadian-born American film actress. Born in Montreal, Aug. 10, 1904, she worked there as a photographer's model. Going to New York, she played in film comedies, and then went to Hollywood. Films of this accepted beauty of the screen included *Smilin' Through*, 1933; *The Barretts of Wimpole Street*; *Romeo and Juliet*; *The Women*; and *Her Cardboard Lover*, 1942. Her first husband was the film director Irving Thalberg (d. 1936).



Norma Shearer, Canadian-born American film actress

Shear Legs or **SHEERS**. In engineering, a support for lifting-tackle. They consist of two almost vertical legs, of equal length, connected at the top to a third steadying leg. Shear legs are used in dockyards for handling boilers, machinery, and big guns. As the shear legs are raised or lowered

Shear Legs. Diagram illustrating action of shear legs lifting steam boiler from a quay and depositing it in a barge. A. Steam cylinder. B. Crank shaft. C. Winch barrel

in the process of hoisting, they open out or close in, somewhat in the manner of a pair of shears. They were used for masting sailing ships.

Shears. Name given to various appliances having a pair of opposed cutting edges which work by being crossed, or by meeting on the material to be cut. One type resembles a large pair of scissors,

(*q.v.*), having two level-edged blades pivoted together and sliding one over the other, used for cutting cloth, sheet metal, etc. In another type the blades are not separate and pivoted, but are joined at the top by a spring bow which normally keeps them apart. For cutting sheet metal there is a shearing machine with a pair of rotating cutters, the edges of which overlap. Another kind of shearing machine for cutting metal rod or bars is usually operated by power.

Shear steel was the name given to a grade of steel made from blister steel by a hammering process at welding heat. Single-shear steel on which the process was repeated was called double-shear steel. Both were formerly used for sheep shears and similar cutting tools. See Steel.

Shearwater. Name given to a genus of birds, related to the petrels. The Manx shearwater (*Puffinus puffinus*) is 15 ins. long, and has the plumage black on the upper parts and white below, the neck being slightly mottled with brown. It occurs around the S. and W. coasts of Great Britain and Ireland, but is most abundant on St. Kilda, and in the Orkney and Shetland Isles. During summer it remains in burrows by day, and goes fishing at night; but in winter it is about during the day. The sooty shearwater, greater shearwater, and dusky shearwater are occasionally met with during the winter months.

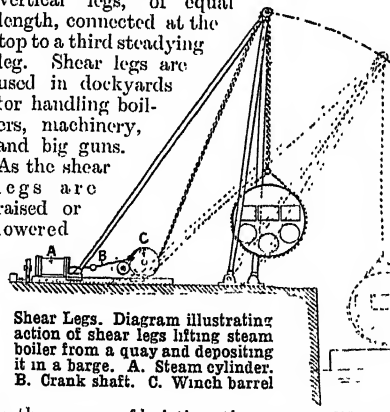
Sheat Fish. Large family of fishes, known as the Siluridae. Numbering about a thousand species, they are characterised by the presence of conspicuous barbels round the mouth and by the absence of scales. The skin is sometimes smooth, but in some species covered with small bony plates or knobs. The fish are found in the rivers and estuaries of most warm parts of the world, but only one species, the

Wels (*Silurus glanis*), is known in Europe, where it is found in the rivers E. of the Rhine. From 6 to 9 ft. long, black on the back, with green sides and yellowish underparts, it eats frogs and fish, and sometimes waterfowl.

Sheath (Anglo-Saxon *scæth*). Closely fitting protective covering of an object, such as the blade of



Shawm. Obsolete wind instrument



a tool or weapon; e.g. the scabbard of a sword. In botany the term is used for the base of a leaf enveloping a stem, also for a spathe or stipule with a similar function; and in zoology for a skin or other tissue enclosing an elongated part; the elytron or wing-case of a beetle; and the protective covering of certain protozoa. *See* Sword.

Sheathbill (*Chionis*). Small group of birds, placed by zoologists between the snipes and the gulls. Found in S. America and the Falkland Islands, they are about the size of pigeons, have white plumage, and bear some superficial resemblance to gulls. They are common about the coasts, nesting among the rocks, and their food consists of small molluscs and refuse.



Sheathbill, the yellow-billed species
W. S. Berridge, F.Z.S.

Sheba. Ancient kingdom in the S. part of Arabia Felix. Celebrated for its gold, frankincense, spices, and precious stones, and by some identified with Yemen, its queen came from the "utmost parts of the earth" to hear the wisdom of Solomon (1 Kings 10; Matt. 12). Its people were known as Sabaeans. Abyssinian tradition dates its royal house from Solomon and the queen of Sheba, but it is doubtful whether Solomon's visitor came from the Arabian Sheba or from the Ethiopian Seba, whose people were also known as Sabaeans. Sheba is the name of three persons mentioned in Genesis: 10, v. 7; 10, v. 28; 25, v. 3. *Consult* The Queen of Sheba, Sir Wallis Budge, 1922.

Shebat. Eleventh month of the Jewish sacred, and 5th of the civil year, mentioned by Zechariah (1, v. 7). It corresponds approximately with Jan. or Feb. *See* Calendar.

Shebeen. Term applied, especially in Ireland and Scotland, to a house where excisable liquor is retailed without a licence, and hence generally to a mean inn. The termination -een points to an Irish origin, but the derivation of the word is uncertain.

Sheboygan. City of Wisconsin, U.S.A., the co. seat of Sheboygan co. It stands on Lake Michigan, at the mouth of the Sheboygan river, 50 m. N. of Milwaukee, and is served by the Chicago and North-

Western rly. It has a state fish hatchery, and in 1938 the city was the largest cheese-shipping centre in the U.S.A. Pop. 40,638.

Shechem. Ancient name for Nablus (*q.v.*), a town of Ephraim, near Mount Gerizim and on the main road from Jerusalem to the North. The battle fought here, in which the British defeated the Turks, Sept., 1918, known as the battle of Shechem, resulted in the conquest of Palestine. Under Allenby, the British army consisted of 12,000 sabres, 57,000 rifles, and 540 guns. The great majority of the men were Indians. The total strength of the Turks and Germans under Liman von Sanders was upwards of 100,000 men, of whom about 36,000 were effectives, with proportionate artillery. Opposed to the Turks were also the Hejaz Arab army, estimated at 40,000.

At 4.30 a.m. on Sept. 19, after a short but powerful bombardment, the main attack was launched on a front of about 16 m., from Rafat to the sea. Taking the Turks completely by surprise, it overran their entire defensive system, in some places to a depth of five m., within three hours. Then the cavalry poured across the broken trenches, and by Sept. 20, the infantry were converging on Shechem from W., S., and E. On Sept. 21 the Turkish rearguards were driven in, and British and French troops entered Shechem.

By Sept. 24 the last remnants of the two Turkish armies, the 7th and 8th, that had held Palestine W. of the Jordan, were gathered in. More than 25,000 prisoners and 250 guns had been taken.

Shechinah (Heb., dwelling). Term used in extra-Biblical Jewish literature. Its use seems to have been suggested by Exod. 10, v. 35, where a cloud, symbolising God's presence, is said to have dwelt above the tent of meeting. Thus the expression is employed either as a periphrasis for the divine name, to render the language less anthropomorphic, or as a designation of the divine presence.

Shee, Sir Martin Archer (1769-1850). British artist. Born in Dublin, Dec. 20, 1769, he studied art in Dublin and came to London in 1788, entering the Royal Academy schools in 1790. He first exhibited at the R.A. in 1791, and



Sir Martin Shee,
British artist

gained a great reputation as a portrait painter. He took the place of Lawrence as the portraitist of the day, his sitters including members of the royal family. Elected A.R.A. in 1798, he became R.A. in 1800, assisted in the foundation of the British Institution in 1807, and was elected P.R.A. and knighted in 1830. Shee was a friend of Burke and Byron, and published some poems, several novels, and a tragedy. He died at Brighton, Aug. 19, 1850.

Sheehy-Skeffington, FRANCIS (1878-1916). Irish writer and politician. Born at Baileboro, co. Cork, Dec. 23, 1878, he entered University College, Dublin, in 1890, becoming registrar there, 1902-04. An eager Irish nationalist, and a leader of the Irish Independent Labour Party from 1908, in 1915 he served a term of imprisonment for speeches prejudicial to recruiting, and on April 26, 1916, during the disturbances arising out of the Easter rising (*see* Ireland), he was shot by a British officer in Portobello Barracks, Dublin. He wrote a Life of Michael Davitt, 1908; a novel, In Dark and Evil Days, was published posthumously in 1916.

Sheen, EAST. District of Greater London, part of the co. of Barnes, Mortlake, and E. Sheen, Surrey, England. It is situated between Richmond Park, S., and Mortlake, N.; Sheen Common being on its S.W. border and Palewell Common, S.E. The district is largely residential. *See* Barnes.

Sheep. Name applied to ungulate mammals of the genus *Ovis*. Several species of wild sheep exist in the high mountainous areas of the world, but the vast majority of the world's sheep belong to domesticated breeds, their number being estimated to be some 600,000,000. Of these domesticated sheep, about half the total number are wool-bearing. The remainder have a skin covering of rough hair, but this is sometimes underlain with an under-coat of fine wool.

Most sheep without wool inhabit the hotter and drier parts of the world, being found chiefly in Asia and Africa. Many are desert dwellers, carrying stores of fat in rump or tail. Such sheep provide meat and milk for human use, but not as a rule fibre for textiles. The closely curled coat of the newly-born lamb of the Karakul, however, a breed native to E. Asia, but reared extensively in S.W. Africa, is the Persian

lamb and Astrakhan fur of commerce.

Most wool-bearing sheep are found in Europe and in the newer countries of America, Africa, and Australasia which have been colonised from Europe. Their products—wool and mutton—are important in international trade. Thus, wool and mutton grown in Australia, New Zealand, S. Africa, S. America are transported to thickly populated Europe for manufacture and consumption.

Although all the wool-bearing breeds of sheep produce both wool and mutton, the relative value and importance of these two products varies in different breeds. Thus, the finest and most valuable wool is produced by merino sheep, a breed in which the mutton is of inferior quality. Merino sheep, so far as history records, originated in Spain, and for a long period the growing of merino wool was a monopoly of Spain. After the Napoleonic wars, however, merino sheep spread to the rest of Europe, including England, and subsequently to all quarters of the world, until Australia and the Union of S. Africa became the two chief centres of merino fine wool production.

English Wool and Mutton

England has always been famous for its sheep, although no English breed ever equalled the Spanish merino in fineness and quality of fleece. Nevertheless, in medieval England, wool-growing was one of the most important national industries and a major source of the country's wealth. English wools were of two types—short and long. English short-wool was in competition with Spanish wools, being used for rather similar purposes in textile manufacture. English long-wool, characterised by great length, strength, and thickness of fibre was, on the contrary, unique, and unrivalled in its class by the wools of any other country. English sheep in medieval times were, therefore, bred primarily for their wool. In the latter part of the 18th century, however, two factors led to a change in the breeding of English sheep, by which mutton became of greater importance than wool. One factor was the competition of the wool producing industry of the British colonies; the other was the increased meat consumption of the expanding industrial population of the English towns.

One English breeder who was a pioneer in improving the mutton qualities of English sheep was

Robert Bakewell of Dishley Grange, Leics, who, working with the long-wool sheep native to his county, attained his object—to breed sheep that fattened more easily and became mature at an earlier age by producing the new or improved Leicester sheep which were subsequently used to improve the mutton qualities of virtually all the long-wool breeds of England. John Ellman of Lewes, in Sussex, who evolved the Southdown breed, used to improve the mutton qualities of virtually all other English short-wools, did for them what Bakewell did for the long-wools.

Thanks to these two great sheep-breeders, the mutton-producing qualities of English sheep came to surpass those of any other country. Consequently, whenever and wherever it was desired to change the primary product of sheep from wool to mutton, the quickest and most effective means of doing so was to cross with rams of the improved English mutton breeds. This led to an important export trade in English pure-bred sheep, a trade that reached its greatest prosperity after 1880, when the invention of refrigeration led to the development of an international traffic in frozen meat. Several countries of the southern hemisphere—notably New Zealand and Argentina—changed the emphasis of their sheep industries over from wool to mutton, since the commerce in frozen mutton gave a new outlet and possibility of much greater profit. This change resulted in a great demand from these countries for English mutton sheep. At first this demand was almost entirely for English long-wools, since these were found to give an excellent cross with the fine-wooled merino. The long-wool merino cross produced a mutton carcass better than that of either parent breed; the fleece combined a good deal of the fine quality of merino wool with the length and weight of the long-wool. Various long-wool breeds—Leicester, Lincoln, Romney Marsh—were widely used. The original and famous Canterbury New Zealand lamb was a cross between the Leicester and merino breeds. The Lincoln—the English long-wool that produces the heaviest fleece and strongest wool of all sheep breeds—became the most popular breed in S. America. The Romney Marsh found a second home in New Zealand.

As the trade in frozen mutton developed and technique of re-

frigeration improved, competition between mutton-exporting countries became ever keener. To secure the finest quality of frozen lamb carcasses, a demand arose for the improved mutton breeds of English short-wools, particularly for the Down breeds, among which, as regards mutton quality, the Southdown remains supreme. In New Zealand, the cross between English long-wool and Spanish merino has become stabilised as a new and distinct breed, the Corriedale. In Australia, the Polwarth is a new and distinct breed of somewhat similar origin. These new breeds (and similar breeds have been evolved in America) produce good mutton and good wool.

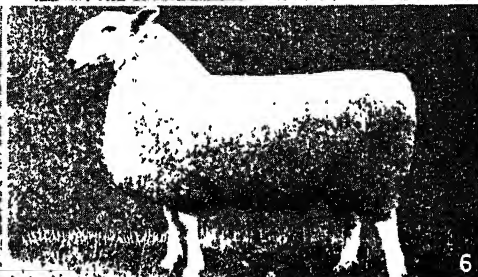
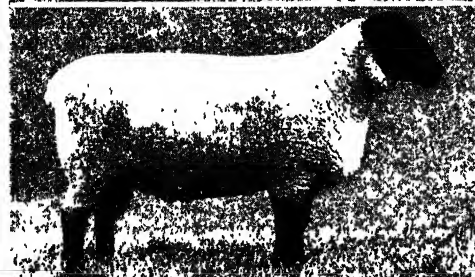
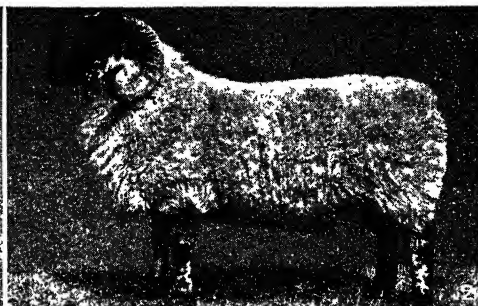
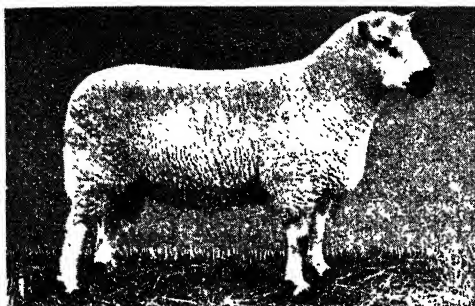
Sheep-rearing also constitutes an important element in general farming, and there are breeds or crosses suitable for all situations. In Great Britain alone there are more than 30 recognized breeds: in addition to the long-wools (Leicester, Lincoln, Romney Marsh, Wensleydale, Border Leicester, etc.), and the short-wools (Southdown, Suffolk, Shropshire, Oxford, Ryeland, Dorset and Devon, etc.) there are the hill breeds, specially hardy and by far the most numerous and economically important sheep breeds in the U.K. Usually they produce mutton of excellent quality, although most hill sheep require fattening in the lowlands before slaughter. Their wool is often, but not always, of rather coarse quality and low market value. The most important British hill breeds are Scottish Blackface, Welsh Mountain, Cheviot, Swaledale, and Herdwick.

In some countries, the sheep is of some importance as a dairy animal. The Dutch East Friesian sheep gives as much milk as a goat. The milk of several European sheep breeds is made into cheese, and in certain of the countries of Europe with a peasant economy—e.g. Greece and Albania—there is actually more butter and cheese made from the milk of sheep than from that of cows.

Allan Fraser

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Sheep Dip. Preparation for curing sheep of disease. Sheep are liable to suffer from a parasitic dis-



1. Kerry Hill 2. Blackface. 3. Kent or Romney Marsh 4. Southdown 5. Suffolk. 6. Border Leicester.
7. Welsh Mountain. 8. Cheviot 9. Exmoor Horn 10. Hampshire

SHEEP: PRIZE SPECIMENS OF RAMS OF THE PRINCIPAL BRITISH BREEDS

By courtesy of The Farmer and Stock-Breeder

ease known as sheep scab, due to a mite (*Psoroptes communis*) that burrows in the skin. The Sheep Scab Order (1905) of the board of agriculture, intended to eradicate this pest, prescribes notification of the disease to the police, and makes dipping in some solution compulsory. There are many approved proprietary dips, the use of which involves little trouble; or a home-made dip can be prepared by dissolving 5 lb. of soft soap—with gentle warming—in 3 quarts of liquid carbolic acid (not less than 97 p.c. in strength), and adding water to make up 100 galls. Various hand-baths and swim-baths are in use, the latter being preferable. Dipping destroys other parasites that may be present and improves the quality of the wool.

Sheepdog. The old English breed of sheepdog much used by shepherds, drovers, and farmers, is from its most striking feature often known as the bob-tailed sheepdog. It should be born without a tail, but the fact that tailed specimens appear in most litters shows that this feature is not permanent. This dog, which has



Sheepdog. Shetland sheepdog, known as a toomie. Top, champion of the old English breed

remarkable intelligence, is a large and heavily built animal, with a rough, harsh coat of grey or bluish colour. The head is square and massive, and the tuft of wavy hair on the forehead makes it appear larger than it really is. Abundant exercise is absolutely necessary for this breed, and it should never be kept chained up or confined in a yard. In Scotland and the English Border country sheepdog trials (in which collies and Shetland sheepdogs figure as well as the

old English sheepdog) and competitions in driving and penning sheep are popular events. See Dog, colour plate.

Sheep Ked (*Melophagus ovinus*). Wingless insect of the order Diptera, family Hippoboscidae. Living as a blood-sucking external parasite on sheep, it is popularly known as sheep tick.

Sheep Maggot Fly (*Lucilia*). Metallic green or bluish fly of the family Tachinidae, popularly known as green bottle. Certain species lay their eggs in the soiled wool on sheep, and the maggots on hatching penetrate the skin, causing festering sores.

Sheep's-bit Scabious (*Jasione montana*). Annual downy herb of the family Campanulaceae. A native of Europe, N. Africa, and W. Asia, it has oblong leaves, and small lilac-blue flowers packed into a half-round head. It is found on

heathy pastures in Great Britain and Ireland.

Sheepshanks, JOHN (1787-1863). British art collector. Born at Leeds, son of a rich cloth manufacturer, he entered his father's business. Having developed a great interest in art, he acquired a large

collection of works by British artists. In 1857 he presented 233 oil-paintings and nearly 300 drawings to the nation, the collection being housed in South Kensington Museum. He died in London, Oct. 5, 1863.

Sheepshanks, RICHARD (1794-1855). British astronomer. A younger brother of John Sheepshanks, he was born in Leeds, July 30, 1794, and educated at Richmond School and Trinity College, Cambridge. Elected fellow of Trinity, he became a barrister and was ordained, but did not work at either profession, his main interest being astronomy. In 1829 he became secretary of the Royal Astronomical Society, and he did a great deal of work for the royal commission on weights and measures, of which he was a member. Sheepshanks, who died at Reading, Aug. 4, 1855, made a valuable collection of astronomical instruments.

Sheepshead (*Sargus oris*). An American food fish of the family Sparidae. Found along the Atlantic coast of the U.S.A., it grows to a length of 30 ins. and an aver-

age weight of about 7 lb., though specimens have been found weighing 20 lb. It is deep in the body, marked by seven or eight dark transverse bands. The name is derived from the shape of the head and the prominent incisor teeth. Except during the spawning season, March-June, it is gregarious in habit. It feeds on small crustaceans and shellfish, which it detaches from the sea bottom by means of its incisors.

Sheep Stealing. In English law, a felony under the Larceny Act. Once a capital offence, it is now punishable with imprisonment up to 14 years.

Sheerness. Seaport and urban district of Kent, England. It stands at the mouth of the Medway, on the N.W. of the Isle of Sheppey, 52 m. from London. It is served by rly., and by steamers to and from London, Southend, and elsewhere. The town is divided into three districts, Blue Town, Mile Town, and Marine Town. Blue Town is the dockyard quarter. The industries centre upon the royal dockyard, which is strongly fortified, and includes wet and dry docks, storehouses, etc. Connected with it are naval barracks and a coastguard station. A bronze tablet in the dockyard church commemorates the 1,070 officers and men who lost their lives when the warships Bulwark and Princess Irene were destroyed in the harbour by internal explosions Nov. 26, 1914, and May 27, 1915, respectively.

The modern portion of the town, Sheerness-on-Sea, is a watering-place, with good beach, esplanade, and bathing facilities. Sheerness originated in a fort built about 1660, to protect the Thames and Medway entrances. A dockyard was established which grew considerably during the 19th century. In 1667 the Dutch fleet captured the fort, but it was quickly recovered by the English. Pop. 16,400.

Sheet Anchor. Largest anchor used on a ship and cast in case of danger. Its more correct name is shoot anchor, as it is released or shot quickly from the hawse-pipe.

Sheet-Flood. In geology, a shallow flood of water moving down a gentle slope not adequately provided with drainage channels. Sheet-floods often occur in arid or semi-arid countries where rainfall is sporadic but heavy. Rain falling several inches an hour cannot percolate or drain away, and the water, carrying with it surface débris, moves down hill as a sheet.

Sheet Metal. Flat rolled product, the dimensions of which come within certain limits. These limits vary according to material, method of rolling, and other factors. Sheet is rarely more than $\frac{1}{4}$ in. thick. If it exceeds this, and if its width is relatively large, the metal is termed plate, while if the width and thickness are similar it is bar. If the thickness is somewhat less than $\frac{1}{4}$ in., and the width is small, the metal may be termed strip.

Sheet Metal Working. This industry is concerned with the manufacture of articles from flat sheet metal, usually not more than $\frac{1}{16}$ in. thick. The trade known as panel-beating is manual sheet metal working in its most skilled form. A panel-beater can produce rounded convex and concave shapes from flat sheet by a process consisting mainly of manual hammering. To some extent panel-beating has been superseded by the mechanical processes of pressing and deep drawing, but it is still used for repair work and when small numbers of an article are required. Tin cans, milk cans, domestic water tanks, ventilating ducts, metal boiler flues, motor car bodies, and metal coach bodies are typical sheet metal products. Riveting and soldering were formerly needed for making joints in sheet metal work, but fusion, spot, projection, and seam welding have now greatly widened the scope of the work and largely replaced the older methods.

Sheet Piles. Piles driven side by side, usually of steel and generally interlocked along their edges. They are used to retain earthwork with a vertical or nearly vertical face, especially when in contact with water, as with wharves and quay walls, or for protecting river banks, and where it is necessary to prevent ingress of water. They are also used in building bridge piers and under-water foundations. *See* Bridge; Pile Driving.

Sheffield. City of Yorkshire (W.R.), England. It is situated on the border of Derbyshire, where four tributaries flow into the River Don, 157 m. from London. It is

served by rlys., and linked by water with the Humber. Since 1911 it has been the largest city in Yorkshire and fifth in England. Area, 39,596 acres. Pop. 508,370.

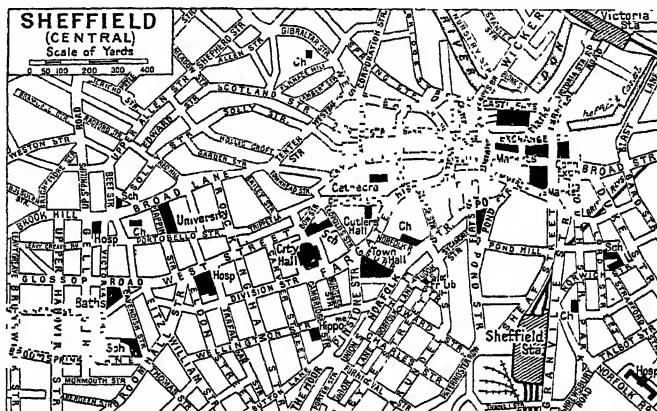


Sheffield arms

The Saxon manor was entirely rural, and was the principal manor in the sub-shire of Hallamshire. Sheffield as an urban centre originated when a Norman lord, William de Lovetot, built a castle at the junction of the Sheaf and the Don early in the 12th century. At the end of that century the manor passed to the family of Furnival, and then to the Talbots, earls of Shrewsbury. In the 17th century, through one of the co-heiresses of the Talbots, who married Thomas Howard, earl of Arundel and Surrey, it passed to the Howards, afterwards dukes of Norfolk. Mary Queen of Scots was imprisoned in Sheffield, 1570-84, living generally in the castle but for short periods in the Manor Lodge of which the remains still

the Company of Cutlers in Hallamshire was incorporated, replacing an earlier manorial system of control; though many of its ancient powers have devolved upon other authorities, it is still the sole authority over trade marks on any metal in Hallamshire.

About 1742 Benjamin Huntsman, who came to the town from Doncaster, invented the crucible process of steelmaking, and by the middle of the 19th century Sheffield had become the national centre for the making of fine steel. A succession of pioneers in steel-making processes, many (though not all) Sheffield men, built up a huge industry in special steels, armour plate, and guns, and important engineering products such as crank axles and pistons, tram-



Sheffield, Yorkshire. Plan of the central districts of the city

exist. In 1643 the castle was taken for the king by the duke of Newcastle. The next year it surrendered to the parliamentary forces, and was demolished 1648.

The presence of water power, timber for charcoal, local iron ore, sandstone for grindstones, and (important at a later date) coal, limestone, and refractory materials determined the local industries. Knives were made in the town in the 14th cent., iron was worked near by in the 12th cent. After the adoption of water power in the 15th cent., the manufacture of cutlery developed rapidly as a domestic industry. Although steam power was largely substituted for water power at the industrial revolution, the "little mester" continued to be important right through the 19th cent. There are still many small firms beside the big ones. Cutlery includes knives, razors, scissors, agricultural implements, surgical instruments, and edge tools of all kinds. In 1624

way crossings, boilers, propeller shafts and cranks, and castings of all kinds.

In 1740 Thomas Boulsover invented the plating process known as Old Sheffield Plate, and a silver industry was established. About 1850 the process was superseded by electro-plating, and the making of solid silver and electro-plated wares is still an important element in Sheffield trade. Coalmining, typefounding, brewing, and some smaller industries are also carried on. The study of glass technology has become important latterly.

As a result of the development of these industries, Sheffield grew rapidly from the mid-18th century onwards. In 1843 it was incorporated as a borough, and in 1893 became a city. The city has had a lord mayor since 1897. It returns 7 M.P.s.

The town, which until very recent times was small, crowded, and mean, with narrow winding streets and rough industrial build-



Sheffield, Yorkshire. 1. Town Hall, opened 1897. 2. High Street. 3. City Hall, built 1932, which seats 5,500. 4. Weston Park and City Museum. 5. Cathedral church of SS. Peter and Paul

ings in the centre, began to grow in the 18th cent. along the valleys of the Sheaf and the Don. During the 19th cent. the built-up area gradually covered all the inner ring of the magnificent hills which rise from the Don valley, and residential suburbs were built in the west, while to the N.E. the great works of the heavy industries extended to the borders of Rotherham. After 1900 the boundary was extended to include large parts of the neighbouring parishes and of N. Derbyshire.

The first parish church was built by William de Lovetot in the 12th century, but the oldest part of the fabric now standing is the 15th century tower and chancel. The diocese of Sheffield was created 1914, when the parish church of S. Peter and S. Paul became the cathedral church.

The chief R.C. church is that of S. Marie in Norfolk Row. Nonconformist churches include the Victoria Hall (Methodist), Nether Chapel (Congregational), and Upper Chapel (now Unitarian, with a dissenting tradition back to the mid-17th century). Within the city boundary are the remains of Beauchief Abbey.

The city's other prominent buildings include the town hall, opened 1897, enlarged 1923, containing council chamber, banquet-

ing hall, and municipal offices, and tower 180 ft. high, bearing a statue of Vulcan; the central library and Graves art gallery, 1934; the city hall, 1932, with seats for 5,500 for concerts and meetings; the cutlers' hall, built 1832, enlarged 1888; the city museum in Weston Park; and the Ruskin museum in Meersbrook Park. The university received its charter in 1905.

German air raids of the Second Great War caused damage to residential, industrial, and commercial property within the city, especially the concentrated raids made on Dec. 12 and Dec. 15, 1940.

The Sheffield city council is composed of 100 members, of whom 25 are aldermen. The city is divided into 25 wards. Since 1888 the council has owned the waterworks, which now include 13 storage reservoirs in four of the valleys tributary to the Don, and a quarter share in the reservoirs of the Derwent Valley water board. The electric supply department was owned by the corporation 1898-1948, and has a generating plant with a total capacity of 317,000 kW. An excellent system of tramways and buses is run by the corporation. The market rights, first granted in 1296, were bought in 1899 by the corporation,

who have greatly extended the market accommodation. There are 2,955 acres of public park and woodland, good facilities for sport, and ample schools and hospitals. Two commercial theatres, the Playhouse (run by the Sheffield Repertory Company), and many cinemas cater for amusements. Market days, Tues., Fri. and Sat.

Sheffield, UNIVERSITY OF. English university. It was founded in 1905, being an extension of Firth College, dating from 1879, and including also the Sheffield school of medicine, established in 1828, and the technical school of 1884. The faculties include arts, law, science, medicine, engineering, and metallurgy, with departments of architecture and glass technology. The buildings are in two main blocks; one, a modern pile in the Tudor style, adjoins Weston Park. They include a fine library, laboratories of all kinds, and an observatory. There are two residential halls for men and two for women. See Gowns, colour plate.

Sheffield, JOHN BAKER HOLROYD, 1ST EARL OF (1735-1821). British politician. Son of Isaac Holroyd, a man of Yorkshire descent with Irish estates, Holroyd bought the Sheffield Place estate, Sussex, from Lord de la Warr, 1769, and as a soldier and politician became prominent in the suppre-

sion of the Gordon riots, 1780. He was created Baron Sheffield in the peerage of Ireland in 1781, and while an Irish peer represented Bristol in parliament, when he supported the Union. In 1816 he was made earl of Sheffield, also an Irish title. He was president of the board of agriculture, 1803, and a lord of the board of trade, 1809. Sheffield was the most intimate friend of Gibbon, whose works he edited in 1796. He died May 30, 1821.

Sheffield Plate. Name given to articles made of copper and plated with silver by a process of fusion or soldering. In 1742-43 Thomas Boulsover (1704-88), a Sheffield mechanic, discovered a method of fusing copper and silver, which he turned to account in the manufacture of various small plated articles. His invention was developed into an important industry by Joseph Hancock, from 1758 onwards, and Sheffield plating, now an extinct art, held the field until the introduction of electro-plating in 1840. Hancock found that Boulsover's invention could be employed in plating copper candlesticks, coffee-pots, salvers, etc., of elaborate design, in imitation of wrought silver, and his example was followed by other manufacturers in Sheffield and Birmingham, where Boulton began to produce plated goods in 1764.

To form the sheets of metal required in the manufacture of Sheffield plate, an oblong ingot of copper was carefully planed to receive on one or both sides a thin plate of silver. A sheet of copper was placed over the silver to protect it, and the whole was bound together with wire. The ingot was put in the plating furnace, and heated to a critical temperature just below that of complete fusion. It was withdrawn, the silver now being solidly united with the copper base, and allowed to cool. The wires and copper sheet having been removed, the ingot was converted in a rolling mill into a sheet of the required thickness. See *Electro-Plating*.

Sheffield Shield. Cricket trophy competed for between the states of Australia. It was presented in 1892 by Henry North Holroyd (1832-1909), 3rd earl of Sheffield, who took an eleven to Australia 1892-93. The Sheffield Shield competition provides the chief matches in Australian cricket.

Sheffield Telegraph. British daily newspaper. It was established in 1855 as the Sheffield Daily Telegraph, and came under

the control of the Leng family in 1864. In 1925 the paper was bought by Allied (now Kemsley) newspapers, and in 1938 incorporated the Sheffield Independent. The Sheffield Star is an evening paper published by the same organization.

Sheffield United. English professional Association football club. They entered the Football League in 1893, and their record includes the League championship for 1898, and the F.A. Cup in 1899, 1902, 1915, and 1925. The final Cup tie was lost in 1901 and 1936. Their ground is at Bramall Lane.

Sheffield Wednesday. English professional Association football club. Established in 1866, they became a member of the Football League in 1892, and won the championship in 1903, 1904, 1929, and 1930. The Wednesday carried off the F.A. Cup, in 1896, 1907, and 1935, and were defeated by Blackburn Rovers in the final in 1890. Their ground is at Hillsborough.

Shefford. Market town of Bedfordshire, England. It stands on the Ivel, 9 m. S.E. of Bedford, with a rly. station. Near is the village of Warden, with ruins of a Cistercian abbey, founded here about 1150. Pop. 2,000.

Sheik or **SHEIKH** (Arab., old man). Arab title of respect. It is applied to Arab chiefs, headmen of villages, preachers, heads of religious orders or communities, and to local saints. The Sheik was the title of a famous novel (pub. 1919) by E. M. Hull (d. 1947). See *Shaikh*. *Pron.* sheekh or shaykh.

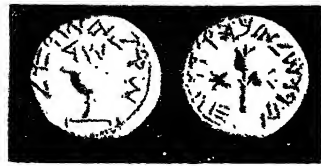
Sheil, RICHARD LALOR (1791-1851). Irish dramatist and politician. Born at Drumdowney, co. Kilkenny, Aug. 17, 1791, he was educated at Stonyhurst and Trinity College, Dublin. He was called to the Irish bar in 1814, and while waiting for briefs wrote or adapted with success several dramas—*Adelaide*, or *The Emigrants*, 1814; *The Apostate*, 1817; *Evadne*, 1819. From 1823 he supported O'Connell in agitation for Catholic emancipation until the cause was gained in 1829. Subsequently Sheil sat in parliament for several Irish constituencies, held office under Melbourne and Russell, and was the first R.C. to be made a privy councillor, 1839. Eventually he became



Richard Sheil,
Irish dramatist
After Catterson Smith

British minister to Tuscany, and died in Florence, May 23, 1851.

Shekel (Heb., weight). Name of a Jewish weight or coin. In the former sense it weighed about 225-



Shekel. Both sides of the Jewish silver coin. Actual diameter, $\frac{1}{2}$ in.

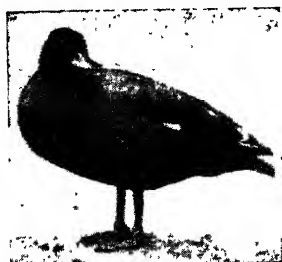
253 grs. or 10 dwts. Troy, according to the system in use. Fifty shekels went to the maneh, of which sixty went to a talent. As coined, the silver shekel was worth about 2s. 8d., and the gold shekel about £2. No gold examples are extant, but silver coins of various dates have been discovered. The emblems on the coin represent a chalice and a flowering lily.

Sheldon, GILBERT (1598-1677). English prelate. Born July 19, 1598, he was educated at Trinity College, Oxford, and was ordained in 1622. He was elected warden of All Souls in 1626 and appointed chaplain to Charles I. He suffered imprisonment under the parliamentary regime, but at the Restoration was made bishop of London, 1660. He was also master of the Savoy, and member of the privy council. In 1663 he was chosen archbishop of Canterbury in succession to Juxon, and took a prominent part in political affairs, becoming one of Charles II's principal advisers. As visitor and chancellor of his university he was energetic and liberal, building at his own expense the Sheldonian Theatre. He died Nov. 9, 1677. See *Oxford*; consult also *Worthies of All Souls*, M. Burrows, 1874.



Gilbert Sheldon,
English prelate

Sheldrake (*Tadorna*). Genus of wild ducks, of which two species occur in Great Britain. The common sheldrake (*T. tadorna*) is about 26 ins. long, and the plumage is dark green on the head; green, white, and brown in bands on the neck; black and white on the wings; and dark brown and white beneath. The beak is bright red and has a conspicuous basal knob. The bird holds an intermediate place between the ducks and the geese, and is found on sandy



Sheldrake. Variegated species, or Paradise duck
W. S. Berridge, F.Z.S.

shores, where it feeds on molluscs and marine worms. The nest is usually constructed in a deserted rabbit burrow. The ruddy sheldrake (*Casarca ferruginea*) is an occasional visitor to British shores.

Shell. Hard outer covering of various animals and plants, e.g. seeds and fruits, birds' eggs. The word is more especially used of the external skeleton of certain invertebrate animals. The most important of these are the protozoa, mollusca, and brachiopoda. The shell is usually calcareous (though sometimes siliceous). That of the crustacea (lobsters and crabs) is not a true example, for it is merely a hardening by calcification of the horny cuticle found on other arthropods. The carapace of the tortoise is not a shell but a special skeletal development. Most protozoans possessing a shell belong to the foraminiferan (calcareous) or radiolarian (siliceous) groups. These are found in great numbers in chalk and in ooze from deep oceanic beds.

The typical shell is the molluscan, being found in its simplest form in the bivalves, which possess two valves joined by a horny ligament and composed of a crystalline form of calcium carbonate and a horny material, conchyolin. The calcareous crystals are either of aragonite or of calcite, the exact form varying. The conchyolin forms a thin outer coat (*periostracum*) and inside there are calcareous layers which may show prismatic and pearly iridescent structures. These usually contain some organic material. The outer layers are secreted by cells near the edge of the mantle, and changes in the shape of the mantle are thus incorporated in the valve as ridges or knobs. The valves are usually held together by muscles, the shell opening by the relaxation of these and a force exerted by a ligament joining the two valves.

In the gastropods a univalve coiled shell is found, as in the

common garden snail, although it is sometimes tent-shaped, as in the limpet, or reduced and internal, as in the sea hare (*Aplysia*). In the cephalopods the univalve, coiled, and chambered shell of the pearly nautilus is notable, but other living forms, e.g. squids, have a much reduced internal shell. Another molluscan group, the chitons, have a shell made up of eight plates. See Bivalves; Brachiopoda; Cephalopoda; Cowry; Gastropoda; Mollusca; Pearl.

Shell. Hollow projectile containing an explosive charge and fired from guns, mortars, or howitzers. Spherical cast-iron shells were invented early in the 17th century, and consisted of hollow cannon balls, 80 p.c. of the interior being filled with gunpowder and the remainder containing a slow-burning composition to act as a fuse. In the 18th century a hollow cylindrical shell filled with powder and shot was introduced for use against troops in the open, a length of slow match allowing it to be fused to explode at predetermined height and distance.

There was little alteration in the design of shells until the early 19th century, when a new type of fuse was introduced. This was a wooden tube filled with powder, cut to different lengths to regulate the moment of explosion. In 1845 the time-tube was replaced by the percussion cap, which exploded the shell on impact. Spherical shells were used as recently as the Russo-Japanese war of 1904.

Cylindrical shells with a pointed nose-cap containing an impact fuse were invented by Palliser in 1872, and were made of cast iron. Designed for discharge from rifled guns, they were caused to rotate in flight by metal studs, arranged spirally on the outside of the case, which engaged with the rifling of the gun. As the studs allowed the escape of propellant gases between shell and barrel, so creating erosion of the gun's bore, they were replaced by a lead band. The lead, however, was liable to clog the bands during rotation, and in 1888 was abandoned in favour of the present copper driving band.

Gunpowder was the only explosive used in shells until 1886, when picric acid was introduced, to be replaced by the present trinitrotoluene in 1902. With the introduction of armour plating, cast iron proved ineffective; and shell cases are now made from forged or cast steel. With the exception of shrapnel (*q.v.*), shells are essentially destroyers of material,

and the object of the designer of projectiles is to fill the shell with high explosive of maximum destructive effect.

Except those discharged from light howitzers, all modern shells are of cylindro-conical shape. The head is sometimes fitted with a long, tapering, dummy cap, which, by reducing wind resistance, increases range. The largest shell yet used in warfare is the naval 16-in., weighing over a ton. Shells up to 4.5 ins. in diameter incorporate the case containing the propellant charge; the charge of bigger ones is contained in a separate case, which is inserted into the breach after the shell.

Other types of shell include smoke shells, filled with chemicals which on bursting combine to generate dense smoke. Star shells enclose a parachute and chemical candle; when the explosive charge bursts, the parachute is released and the candle ignites to illuminate the ground. Gas shells are filled with poisonous gas released when the case bursts. A.A. shells are similar to the destructive type used on the ground, except that they have a stronger propellant charge, do not exceed 5.5 ins. in diameter, and have either a time fuse or a radio-proximity fuse. Shells for use against armoured fighting vehicles have thick steel noses which penetrate the plating before bursting. See Ammunition; Bomb; Cartridge; Chemical Warfare; Explosives; Fuse; Incendiary Weapons; Shrapnel; Star Shell; Tracer Shell.

David Le Roi

Shellac. Resinous preparation from the *Ficus religiosa* and other similar East Indian trees. See Lac.

Shellal. Village of Egypt. It is situated on the Nile, opposite Philae above the Assuan dam, and is the terminus of the rly. from Cairo, and the starting point of river steamers, which serve to connect the Egyptian state and Sudan rly. systems.

Shelley, MARY WOLLSTONECRAFT (1797–1851). British author. Born in Somers Town, London, Aug. 30, 1797,



Mary Wollstonecraft Shelley, British author
After R. Rothwell

she was the daughter of William Godwin and Mary Wollstonecraft Godwin. In 1814 she met the poet Shelley, then alienated from Harriet Westbrook, and

three months later left England with him. On the death of Harriet in 1816 she became the poet's wife. In 1818 appeared Frankenstein, her famous story of the man who created a monster and gave it life. This was followed by the less successful Valperga, 1823.

After Shelley's death in 1822 Mary returned to England, where for some time her lines were cast in hard places, owing to the unsympathetic attitude of Shelley's father, Sir Timothy. In 1840, however, Sir Timothy settled a suitable allowance upon her son. She died Feb. 21, 1851. In 1826 she had published The Last Man, a romance in which she scarcely rises to her theme. Lodore, 1835, is the story of Shelley and Harriet cast in the form of a novel. Her Journal of a Six Weeks' Tour is interesting as a source of information regarding her husband's life. *Consult* Life, R. G. Grylls, 1938.

Shelley, Percy Bysshe (1792-1822). British poet. He was born, August 4, 1792, at Field Place, Warnham, Sussex, the eldest son of Timothy Shelley, a wealthy landowner who subsequently succeeded to a baronetcy. After some schooling at Isleworth, Shelley went to Eton in 1804, where he wrote, in the style of Mrs. Ann Radcliffe, two lurid romances, *Zastrozzi*, 1808, and *St. Irvyne*, 1810. Proceeding to University College, Oxford, in 1810, his chosen studies were metaphysics and religious polemics, and he here developed his "passion for reforming the world." His brief university career ended abruptly in April, 1811, by his expulsion for circulating his pamphlet on *The Necessity of Atheism*.

After leaving Oxford, in disgrace with his father, Shelley went to London lodgings in Soho, and made the acquaintance of Harriet Westbrook. In a mood of pity and mistaken chivalry, he committed the gravest mistake of his life by eloping with Miss Westbrook in Sept., 1811, to Edinburgh, where they were married.

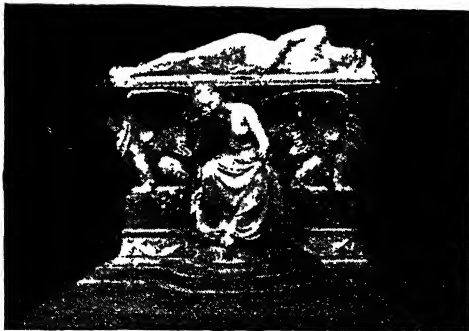
During a sojourn at the Lakes he met Southey, then the idol of his fancy, and in 1812 he paid a flying visit to Dublin, where he made his sole public appearance as a politician, supporting the cause of Catholic emancipation and

the repeal of the Union by delivering speeches and circulating his *Address to the Irish People*. Shelley's first published volume,



M. Shelley

Margaret Nicholson, 1810, and a collection of verse written, with his sister Elizabeth, under the name of Victor and Cazire, 1811, are without promise. His philo-



sophical poem *Queen Mab*, however, begun at Dublin, and printed privately in 1813, although immature, is the work of a poet.

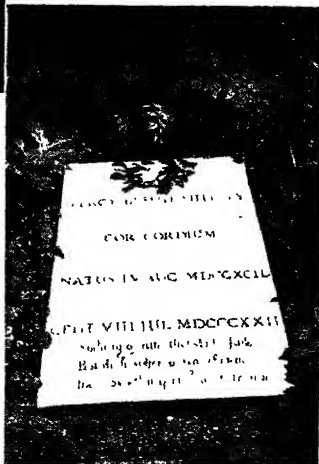
In the meantime, Shelley's marriage turned out badly. The pair were ill-matched, and by the spring of 1814 Harriet Shelley left her husband for a prolonged visit to Bath. During her absence he was frequently at the house of his friend and mentor, William Godwin, of whose extreme republican writings he was an enthusiastic admirer. Here he met Godwin's daughter, Mary, a girl of sixteen with whom he eloped to Switzerland in July, 1814, and to whom he was married in Dec., 1816, after the suicide of his wife. He visited Geneva in the summer of 1816, and was in daily intercourse with

Byron. On his return to England he issued *Alastor* and other Poems, 1816, in which his gifts were first seen in their maturity. His longer poem, *The Revolt of Islam*, 1818, originally entitled *Laon and Cythna*, written at Great Marlow, although abounding in fine passages, like its successor *Rosalind and Helen*, 1819, is but a stepping-stone to what was to come.

In March, 1818, Shelley left England, in search of health, for Italy, and in this more genial climate his genius developed to its full. The noble tragedy of *The Cenci*, 1819, was followed by *Prometheus Unbound*, 1820, written at Este, Rome, and Florence. The "choral song of the regenerated universe," it is his most characteristic work, great alike in conception and performance. In 1821 he settled at Pisa, where he wrote *Epipsychidion*, 1821, the most passionate love-song in the language, and *Adonais*, 1821, his tribute to the memory of Keats. The unwelcome companionship of Byron, who arrived at Pisa in the winter of 1821, caused Shelley to seek solitude at Lerici on the bay of Spezia. On July 8, 1822, he met his death returning by sea from Leghorn, where he had gone to welcome his friend, Leigh Hunt, to Italy. His body was burnt some days later, on the seashore where it had been washed up, and his ashes were afterwards buried in the Protestant cemetery at Rome.

Roger Ingpen

Bibliography. Works, 4 vols., ed. H. B. Forman, 1879-80; Poetical Works, 4 vols., ed. Mrs. Shelley, 1839; 2 vols., ed. W. M. Rossetti, 1870; ed. T. Hutchinson, 1904;



Percy Bysshe Shelley. Stone placed over the poet's ashes in the Protestant Cemetery, Rome. Top, left, Memorial by Onslow Ford, University College, Oxford

Letters, ed. R. Inghen, new ed. 1915; New Letters, ed. W. S. Scott, 1948; Lives, E. Dowden, 2 vols., 1886; T. J. Hogg, new ed. 1906; The Last Days of S. and Byron, E. J. Trelawny, new ed. 1906; Ariel, A. Maurois. 1923; S. at Oxford, ed. W. S. Scott, 1945; S. and the Romantic Revolution, F. A. Lea. 1945; Shelley, E. Blunden. 1946; Shelley, N. I. White, 1947.

Shell-fish. Name given to certain edible mollusca, including lobster, crab, prawn, shrimp, oyster, cockle, mussel, whelk, winkie. etc See separate entries.

Shell Implements. Tools and utensils made from the calcareous integuments of univalve and bivalve mollusca, especially in primitive culture. Examples are scanty from Palaeolithic Europe, where



Shell Implements used in Melanesia and Oceania. 1. Side and end views of adze blade, Fiji Islands. 2 and 3. Fish-hooks, Sandwich Islands

By courtesy of the Trustees, British Museum

the available shells were inferior in size and effectiveness to other natural utensils and to worked bone and flint. They were pierced for amulets and beads, and in Neolithic Egypt and central Europe were ground down into armlets.

The early use of shells as natural cups and as scrapers survives among the most primitive peoples, including Andamanese, Australians, and Fuegians, but was most important in Oceania. In aboriginal N. America shellcraft was specially developed, clams and mussels being used as spoons, besides being hafted for scraping and digging, wrought into knives and hooks, and ground into adzes for canoe making. Conchs served as drinking cups, picks, gouges, and trumpets. The Pacific coast abalone or ear-shell furnished pins, and shell scalpels were used in S. America.

In the Oceanic islands the lack of metal and workable stone imparted to shells a special importance. They furnish Melanesian knives and adzes, Polynesian pearl-shell fish-hooks, Hawaiian cowry net-sinkers—probably amuletic—and breadfruit-strippers in the Carolines. The Ainu use mussels as sickles for harvesting, and the nautilus drinking-cup is widespread. Conchs are still used in W. Mediterranean islands for calling fishermen and field labourers to work. See Conch; Cowry.

Shell Money. Medium of exchange. Shells have been used from prehistoric times by native tribes of Africa, Asia, America, and Australasia. The cowry shell is most common, but the tusk shell, clam shells, and others, or parts cut and ground from them, have been extensively used. Shell money in the Solomon Islands was made by grinding down various sea shells to fixed shapes, and these passed as money in exactly the same way as modern coinage. The wampum of the N. American Indians consisted of a string of shells, often 6 ft. in length. The use of shell money has practically died out as a result of modern methods of coin-manufacture by machinery. See Cowry.

Shell-Shock. Term applied during and after the First Great War to a form of neurasthenia brought on by an explosion or series of explosions. The condition was frequently preceded by concussion of the brain and unconsciousness, and had as symptoms impaired memory, lack of concentration, inability to make decisions, sleeplessness. Absolute rest and suitable psychological and general treatment were prescribed. The term was not used medically during the Second Great War.

Shelta or **SHELDHERU.** Peculiar jargon used by tinkers and other wayfarers in the British Isles. C. G. Leland drew attention to it in The Gypsies, 1882. Later, J. Sampson and Kuno Meyer showed that it is a deliberately perverted form of Gaelic, though Gypsy elements have been introduced into it. An early form of Shelta is found in an 11th century MS., and it probably arose as the secret language of the bards.

Shemakha. Town of Azerbaijan S.S.R. It is 80 m. W. by N. of Baku, near the river Pirsagat. There are fat, soap, dye, and brick works and tanneries. It was once famous for its silk trade, which greatly declined after the disastrous earthquake of 1902. The old

town, mentioned by Ptolemy, was destroyed by Nadir Shah, 1734. Pop. est. 23,000.

Shenandoah (American Indian, daughter of the stars). Former U.S. airship. Based on the design of the German Zeppelin L49, she was completed at Lakehurst, N.J., in 1923. Her length was 700 ft. and maximum diameter 80 ft., the gas bag being inflated with 2,148,000 cu. ft. of helium. On her trial flight, Oct. 22-26, 1923, she covered 9,000 m. in adverse weather conditions, but she was wrecked in a squall over Ohio, Sept. 2, 1925. 14 of her crew being lost.

Shenandoah. River of Virginia, U.S.A. It rises in two branches and flows 170 m. N.E. through the picturesque and fertile valley between the central range of the Appalachians and the Blue Ridge to join the Potomac at Harper's Ferry. Its valley was the scene of important operations in 1862-64. See American Civil War.

Shenandoah. Borough of Pennsylvania, U.S.A., in Schuylkill co. Situated 107 m. N.W. of Philadelphia, and served by rlys., it is a centre of a rich anthracite coal region. Shenandoah was incorporated in 1866. In 1884 Russian immigrants organized the first Orthodox parish in the nation here. Pop. 19,790.

Shendy. Town of the Anglo-Egyptian Sudan. On the E. bank of the Nile, 105 m. S. of Atbara, it was once a Dervish stronghold. It is an important rly. centre, with cotton factories and iron-works.

Shengjin (Ital. San Giovanni di Medua). Seaport of Albania. It is situated on the Adriatic, 20 m. S. of Shkoder, and has only primitive facilities, though it exports (chiefly to Italy) small quantities of hides, salt, and tobacco.

Shensi. Province of N.W. China. Situated between Kansu and Shansi, it is bounded N. by the Great Wall and W. by the Yellow river. The prov. is intersected by the Weiho. The N. half is a tableland of loess, liable to droughts; across the S. half run the Tsingling Mts., an extension of the Kwenlun range. Coal and iron abound, though they are little exploited. Other minerals found are salt, gold, nickel, and petroleum. The Lungghai rly. runs through the prov. The capital is Sian (Changan). The most disastrous earthquake in recorded history happened in Shensi, Jan. 24, 1556; it is said to have caused 830,000 deaths. Part of the province was already under Communist domination during the China-Japan conflict,

Yenan in the N. being the Communist "capital" 1936-47. Area, 72,919 sq. m. Pop. 9,650,000.

Shenstone, WILLIAM (1714-63). English poet. The son of a farmer who owned a small prop-



William Shenstone,
English poet

erty called the Leasowes, near Halesowen, Worcs, where he issued some early poems for private circulation. He was the author of

The Schoolmistress, a pretty poem burlesquing the Spenserian stanza. There is a certain charm also in his Pastoral Ballads and elegiac verses, in which are appreciable foreshadowings of the return to nature. Shenstone spent more than he could afford on the beautifying of the grounds and gardens of Leasowes, of which he was inordinately proud and which were visited by many famous people. A confirmed bachelor, he died Feb. 11, 1763.

Shepard, ERNEST HOWARD (b. 1879). British black-and-white artist and cartoonist. Born at St. John's Wood, Dec. 10, 1879, he was educated at S. Paul's School, and studied art at Heatherleys' and the R.A. schools. He started drawing for *Punch* in 1907, and became a member of the staff in 1921. In 1945 he succeeded Sir Bernard Partridge as chief cartoonist. Shepard's dainty, airy style of line drawing is perhaps seen to greatest advantage in his illustrations to A. A. Milne's children's books, e.g. *When We Were Very Young*, 1924; *Winnie the Pooh*, 1926; *The House at Pooh Corner*, 1928. These endeared his pictures to a whole generation of children; but almost as well known were his illustrations to *Everybody's Pepsys*, 1926; *Everybody's Boswell*, 1930; *Everybody's Lamb*, 1933; as well as those to works by Kenneth Grahame and Laurence Housman's plays about Queen Victoria.

Shepherdes Calendar, THE. Series of 12 pastoral eclogues "proportionable to the twelve monethes," the first important work of Edmund Spenser (*q.v.*). Dedicated to Sir Philip Sidney, and published in the winter of 1579-80, the eclogues deal with widely varying subjects. Three are concerned with Colin Cloute's unrequited love for Rosalind, i.e. Spenser's passion for an unknown lady;

three others discuss religious matters; one sings the praises of Elizabeth; another is an elegy upon the death of some noble lady; and the remaining four are less definite in their subjects.

The language, so archaic that a glossary was provided after each eclogue, was derived from the theories of Continental contemporaries and the tendencies of Spenser's predecessors. The form is based upon the classical model which the Renaissance had made popular in England as well as in France and Italy. The Calendar revealed Spenser's extraordinary fluency and grace of style, and gained for him immediate recognition as a poet of the first rank.

One of the most popular books of the Middle Ages was a semi-religious compilation known in English in the *Kalendar of Shepherds*, and in French as *Le compost el Kalendar des bergiers*. Its original compiler is unknown, but its description of the Seven Deadly Sins was derived from a 13th century treatise by Friar Lourens (Lawrence), confessor to Philip III of France, which was eventually translated into English by Caxton. The earliest known version of the complete work was printed in Paris, 1493.

This was illustrated by a series of extraordinarily vigorous woodcuts representing country life throughout the year. These appeared in successive French editions dated 1499, 1529, and 1541. The demand for the book persisted for 200 years or more and many English editions were published, including a notable one by Pynson, 1506, though without the wealth of illustration found in the early French issues. Consult *The Kalendar of Shepherdes*, ed. H. O. Sommer, 1892.

Shepherd. One employed in the guarding, feeding, and tending of sheep. The term is also used figuratively for anyone who looks after the spiritual welfare of a number of others. Shepherds are favourite figures in pastoral poetry

Pan was regarded as their tutelary god. See *Sheep*; *Sheepdog*.

Shepherd, JAMES AFFLECK (1867-1946). British artist. Born Nov. 29, 1867, he studied art under Alfred Bryan, the caricaturist. He excelled in animal subjects, becoming famous for his *Zig-Zags* at the Zoo, illustrations in his angular style in the *Strand* magazine. In 1893 he joined *Punch*, and he was later with the *Illustrated London News*. Although best known for humorous drawings—he was awarded a gold medal at an international exhibition of humorous art in Italy, 1911—he made serious studies, his *Captive*, a lithograph of monkeys, being in the British Museum. Publications include *Zig-Zag Fables*, 1897. *Nights with Uncle Remus*, 1903; *The Life of a Foxhound*, 1910; *The Bodley Head Natural History*, 1913. Shepherd died May 11, 1946.

Shepherd's Bush. Dist. of London. In the bor. of Hammer-smith (*q.v.*), it has a green, and stations on the Central and District lines. Trolley-buses run to many suburbs. Here is the White City (*q.v.*), and the Lime Grove film studios bought by the B.B.C. in 1949 for its television service.

Shepherd's Pie. Dish of re-cooked meat and potatoes. The meat is minced, flavoured with onions, carrots, etc., and baked in a pie-dish with a thick covering of mashed potatoes.

Shepherd's-purse OR PICK-POCKET (*Capsella bursa-pastoris*). Annual weed of the family Cruciferae. It is a native of Europe, N. Africa, and temperate Asia. It has a rosette of variable, lobed leaves, and a branched stem bearing minute white flowers. The pods are heart-shaped, two-valved, like an ancient purse, with many seeds.

Sheppard, ALFRED TRESIDDER (1871-1947). British author. He was born June 17, 1871, and educated at Bishop's Stortford. After working for years in an insurance office, he devoted himself to historical fiction. His works included *The Red Cravat*, 1905; *The Autobiography of Judas Iscariot*, 1920; *Here Comes an Old Sailor*, 1927; *Art and Practice of Historical Fiction*, 1930; *Rome's Gift*, 1936; *The Matins of Bruges*, 1938. He died May 10, 1947.

Sheppard, HUGH RICHARD LAWRIE (1880-1937). A British cleric and pacifist, known as Dick Sheppard. He was educated at Marlborough, Trinity Hall, Cambridge, and Cuddesdon College. He was prominent as a pacifist before the Second Great War,



Shepherd's-purse.
Plant showing
leaves, flowers,
and heart-shaped
pods

and in 1934, as a result of his appeal for people to sign a declaration to renounce war, the Peace



H. R. L. Sheppard,
British cleric

Pledge Union was formed. In 1936 he wrote to Hitler asking permission to carry his pacifist movement to Germany, but received no reply; and he was prevented by the Foreign office from flying to Spain to intercede with Gen. Franco for the lives of the people of Madrid. Eight days before his death, Oct. 31, 1937, he was elected rector of Glasgow university, gaining 538 votes; while Winston Churchill polled 281.

Sheppard began his career as chaplain of Oxford House, Bethnal Green, 1907, and was its head, 1909-10. He was chaplain of the order of S. John of Jerusalem, 1910. After being priest-in-ordinary to George V, he was chaplain to the king, 1916-29. In the First Great War he went to France. Returning to take up duty as vicar of S. Martin-in-the-Fields, London, he did much work for the homeless, and the wartime experiment of keeping the church open day and night for prayer and shelter became permanent. His broadcast services from S. Martin's made him a national figure. He left in 1927, and was dean of Canterbury, 1929-31, and canon and precentor of S. Paul's, 1934-37. In later years he was troubled by chronic asthma. His works include *Two Days Before*, 1924; *The Human Parson*, 1924; *Sheppard's Pie*; *If I were Dictator*; *We Say, No*. *Consult Life and Letters*, R. E. Roberts, 1942; *Dick Sheppard: Man of Peace*, C. H. S. Matthews, 1948.

Sheppard, JOHN (1702-24). English highwayman. Jack Sheppard was born at Stepney, London, and took to crime as a lad. Running away from his master, Owen Wood, a carpenter of Wych Street, in the Strand, he moved to Mayfair and Parsons Green, but was several times in prison, on each occasion making his escape with characteristic audacity. A daring highwayman and expert thief, he was at the summit of his career in the summer of 1724, when he



Jack Sheppard,
English highwayman

fell foul of Jonathan Wild. Wild gave him up to justice; he was tried at the Old Bailey on Aug. 14, but he made a daring escape. Captured again, he was chained to the floor of the strongest cell in Newgate, but on Sept. 16 he broke free from his shackles, lowered himself from the roof by aid of blankets, and so escaped. Nine days later he was seized in Clare Market and taken back to Newgate. He was hanged at Tyburn, Nov. 16, his body being buried in the churchyard of S. Martin-in-the-Fields. Jack Sheppard furnished the theme for several plays and books, notably Ainsworth's *Jack Sheppard*, 1840. His portrait was painted in Newgate by Thornhill.

LACK SHEPPARD

The highwayman's name, carved by himself on a beam in his master's workshop

Shepparton. Township of Victoria, Australia. On Goulburn river, 113 m. by rly. N. of Melbourne, it has extensive irrigation works, cattle yards, and frozen meat works. Pop. 7,914.



Claude Shepperson,
British artist

Shepperson, CLAUDE ALLIN (1867-1921). British artist. Born at Beckenham, Oct. 25, 1867, he first studied for the law, but turned to art and studied in Paris and London. The graceful quality of line in his drawing made him well known as an illustrator in black and white, and he was long a regular contributor of drawings to *Punch*. The same gift, with a freshness of colour, is seen in his painting. An associate of the Royal Society of Painters in Water Colours, he was elected A.R.A. in 1919. He died Dec. 30, 1921.

Shepperton. Village of Middlesex, England. A popular angling resort and residential district, it is on the N. bank of the Thames, between Sunbury and Chertsey, 19 m. S.W. of London, with which it has rly. connections. It belonged to the abbey of Westminster.

and the oldest part of its church dates from the 10th cent. William Grocyn was rector, 1504-13. Pop. 3,424.

Sheppey. Island of Kent, England. It is separated from the mainland by the Swale, which connects the Medway and the Thames. It is 10½ m. long and 5 broad, having an area of about 30 sq. m. Although mainly flat, the ground rises gradually from the S. to the N., where the cliffs reach 80 ft. Cereals are cultivated in the N.; in the S. the chief industry is rearing sheep. Sheerness and Queenborough are on the W. side; other places are Minster and Leysdown. The name means sheep island. See Eastchurch.

Shepstone, SIR THEOPHILUS (1817-93). South African statesman. Born Jan. 8, 1817, he was taken to Cape Colony as a child. Proficient in the Kaffir language, he was an interpreter in the war of 1835, and four years later became British resident among native tribes in Kaffraria. Agent for the natives in Natal, 1845, he was appointed judicial assessor in native causes in 1855 and was secretary for native affairs in the Natal government, 1856-77. Trusted and loved by the natives, he had unbounded influence, and little trouble occurred during his administration. Knighted in 1876, he was entrusted with the settlement of the South African states, and in 1877 annexed the Transvaal to Great Britain. He retired in 1880, and died at Pietermaritzburg, June 23, 1893.

Shepton Mallet. Market town and urban district of Somerset, England. Known locally as Shepun, it is 22 m. S.S.W. of Bath by rly. It stands on the little river Sheppey, hence its name. The church of SS. Peter and Paul is a notable old building, famous for its oak roof and various memorials. The town has a beautiful hexagonal



Shepton Mallet, Somerset. Parish church of SS. Peter and Paul, from the south-east



market cross built in 1500 and a grammar school of the 17th century. The chief industries are brewing and the manufacture of silk, velvet, rope, and pottery. There are stone quarries, plaster works, and an agricultural trade. Shepton was long the property of the Mallet family. It was granted a market in the 14th century. In the Second Great War several state records and documents were taken from London and concealed at Shepton Mallet, e.g. Domesday Book, Becket's seal, Wellington's dispatches, and the log of the Victory. Market day, Fri. Pop. 4,100.

Sherard, ROBERT HARBOROUGH (1861-1943). English author. A great-grandson of Wordsworth, he was born in London, Dec. 3, 1861, and lived in Paris. He wrote *Twenty Years in Paris*, 1905, and two works on Oscar Wilde. He died Jan. 31, 1943.

Sherardising. Method of producing a zinc coating on steel in order to improve its resistance to corrosion. It differs from galvanising in that the steel surface is impregnated with zinc in solid powder form at about 350° C., whereas in galvanising the steel is coated either by dipping into a bath of molten zinc or by electro-deposition.

Sheraton, THOMAS (1751-1806). British furniture designer and cabinet-maker. Born at Stockton and wholly self-educated, he settled in London about 1790. He published, among other works, *Designs for Furniture*; *The Cabinet-maker and Upholsterer's Drawing-Book*, 1791; *The Cabinet Dictionary*, 1803. Although highly appreciated, he remained very poor, and eked out his livelihood by teaching drawing. A Baptist, he wrote several religious works. He died in Soho, London, Oct. 22, 1806.

The Sheraton style, which he introduced, marks a reaction against Chippendale (*q.v.*), and is influenced by R. Adam and Hepplewhite. It is in the main an English version of the

Directoire style. It is marked, in its earlier and best stage, by severely simple outline, emphasising the structural lines, and favouring the square form and straight legs, which were often tapered and fluted or reeded. For



Sherborne, Dorset. The 15th-century abbey church. Top, almshouses, also dating back to the 15th century

chair backs we find the lyre and heart shapes, also pillared slats and low carved swags. Canework is often introduced in the chairs and settees, while upholstery is kept down. We find curved lines in the tracery, also low relief carving for Greek mouldings and other patterns. Ornament, chiefly marqueterie, is restrained, though veneer, lacquer, and painting are skilfully used.

Sheraton was a clever mechanic, and devised a great deal of combination furniture, such as folding bedsteads, cabinet-wash-stands, cellaret sideboards with urns for hot and cold water, folding writing tables, and many other contrivances. See *Chair*; *Sideboard*. Consult *Sheraton Furniture Designs*, R. Edwards, 1946.

Sherbet (Arab. *sharbat*). Oriental beverage made of fruit juices, water, and sugar, cooled with snow. In England the name is given to a powder composed of sodium bicarbonate, tartaric acid or oil of lemon, and sugar; when dissolved in cold water, it makes a refreshing, effervescent beverage.

Sherborne. Market town and urban dist. of Dorset, England. It is 13 m. N. of Dorchester, and has a rly. station. Apart from the school (*v.i.*), the chief building is the church of S. Mary the Virgin, a fine cruciform edifice in the Perpendicular style, noted specially for its beautiful roof, once belonging to a Benedictine abbey. There is a 15th century hospital. Sherborne Castle, seat of the family of Wingfield-Digby, was built by Raleigh about 1600. The town has some manufactures, and an agricultural trade.

Settled by the Anglo-Saxons, Sherborne was made the seat of a bishop in 705, remaining so until the see was transferred to Sarum in 1075. For a short time it was capital of Wessex. In the 12th century the Normans founded here an abbey and built a castle.

During restoration of the lady chapel the stone coffin of King Ethelbert was found. Market days, Thurs. and Sat. Pop. 6,400.

Another Sherborne is a village of Warwickshire, 3 m. S.E. of Warwick and just S. of the main road between Warwick and Stratford-on-Avon.

Sherborne School. English public school, at Sherborne, Dorset (*v.s.*). It was founded in 1550 as a grammar school, although there was a school here at a much earlier date, this being connected with the Benedictine abbey. The grammar school took over some of the abbey buildings, and is in a sense the successor of the earlier foundation. In 1870 it was reconstituted as a public school. The buildings include laboratories.



Sherborne School. The gateway and main entrance

museum, workshops, etc., and there are a rifle range and extensive playing fields. The school has room for about 500 boys.

Sherbro OR **SHERBORO**. Island and district of Sierra Leone. The island and Turner's Peninsula, in itself an island separated from the mainland by a long lagoon, form part of the original colony of Sierra Leone, while the dist. known as N. Sherbro, forms an administrative division of the Sierra Leone protectorate.

Sherbrooke. City of Quebec, Canada. It stands at the junction of the rivers St. Francis and Magog, 100 m. E. from Montreal, and is served by C.P.R., C.N.R., and Quebec Central rly. It has a Roman Catholic cathedral. Industries include the making of clothing, machinery, tools, etc. Sherbrooke is the centre of a mixed farming and dairying district, with lumbering and mining in the vicinity. Pop. est. 38,000.

Sherbrooke, **ROBERT LOWE**, **VISCOUNT** (1811-92). British statesman. Born at Bingham, Notts, Dec. 4, 1811, he was educated at Winchester and University College, Oxford, and became a barrister. During 1842-50 he lived in Sydney, as politician, lawyer, and writer. In 1852 he was chosen M.P. for Kidderminster, and in 1859 for Calne, being secretary of the board of control and then vice-president of the board of trade in Liberal governments. From 1859 Lowe was vice-president of the council, being responsible for the education department. No friend to democracy, Lowe in 1864 left office and led the group which Bright called "the cave of Adullam." His brilliant speeches had much to do with the defeat of the Reform Bill of 1866. Nevertheless, now M.P. for the university of London, he became in 1868 chancellor of the exchequer under Gladstone. In 1873 he was transferred to the Home Office for a year. Created a viscount in 1880, he died at Warlingham, Jan. 27, 1892.

Sherburn-in-Elmet. A town, formerly a market town, of Yorkshire (W.R.), England. It is 13 m. E. of Leeds and is served by rly. The chief buildings are the church, mainly Norman, with a noble tower, and an old grammar school. Sherburn was the residence of King Athelstan, and later the archbishop of York had a palace here. Scales are made. Pop. 2,600.

Another Yorkshire village, in the E. Riding, 10 m. E.N.E. of Malton, is also called Sherburn.

Another Sherburn is a village near Durham. A coal mining centre. It is noted for the remains of a 13th century hospital. Pop. 3,182.

Shere Ali (1825-79). Ameer of Afghanistan. Ascending the throne on the death of his father, Dost Mahomed, in 1863, he gained undisputed possession of Kabul in 1869. Friendly relations with the British government became strained about 1875. His refusal to



Shere Ali,
Ameer of Afghanistan

admit a British resident to Herat finally led to war, 1878, and the British invasion of Afghanistan. Shere Ali made his escape to Turkistan, where he died, Feb. 21, 1879. See Afghanistan; Afghan Wars.

Sheria. Town of Palestine. It is 15 m. N.W. of Beersheba (q.v.), on the rly. from the latter town to Damascus. Also known as Tel el Sheria, it is on a hill with the Wady es Sheria in front of it, and gives its name to a battle fought there in the First Great War, when British troops under Allenby, advancing into Palestine, defeated the Turks and entered Sheria, Nov. 6, 1917.

Sheridan, **PHILIP HENRY** (1831-88). American soldier. He was born at Albany, N.Y., March 6, 1831, and educated for the army at West Point. During the Civil War he came into prominence as a skilful and daring cavalry leader, playing a conspicuous part in the battle of Chickamauga. In 1864 he was given command of the cavalry in the army of the Potomac, and the same year became



P. H. Sheridan,
American soldier

commander of the army of Shenandoah. In the last stages of the war Sheridan fought under Grant in Virginia. Sheridan's later service included the conduct of the Indian campaigns, 1868-69. From 1883 until his death, Aug. 5, 1888, he was commander-in-chief.

Sheridan, **RICHARD BRINSLEY BUTLER** (1751-1816). British dramatist and politician. He was born in Dublin, Oct. 30, 1751, a son of Thomas Sheridan (1719-88), the actor, who is also known for his *Life of Swift*. He was at school at

Harrow. His education, however, owed much to his father, who had a passion for oratory, and to his mother, Frances (1724-66), who wrote plays. In 1773 Richard, having begun to write, married Elizabeth, the beautiful daughter of Thomas Linley, the composer, and settled in London. There in 1775 his play *The Rivals* won immediate favour. On the death of Garrick, Sheridan purchased, with his father-in-law and another, the actor's interest in Drury Lane Theatre, and produced *The School for Scandal* there in 1777. His next was a farce, *The Critic*, 1779. These plays receive separate entries in this Encyclopedia.

Sheridan's ready wit and social qualities had made him a great favourite with some of the Whig leaders. He was persuaded to



Richard Sheridan.
After Sir Joshua Reynolds

enter politics, and his election for Stafford in 1780 was the beginning of a parliamentary career. Opposing the war with the American colonies, he made his mark as one of the finest orators of his time; but his greatest speech was delivered on the impeachment of Hastings. Sheridan was an under-secretary in Rockingham's ministry (1782) and a secretary of the treasury in the coalition ministry (1783). In the French wars he stood for non-intervention until Napoleon menaced England directly. He was against the union with Ireland, and championed the freedom of the press.

The concluding portion of his life was overshadowed by financial embarrassments. Drury Lane did

not prosper under his management, and he was a slave to the gambling mania of the age. A heavy blow fell on him when the theatre was destroyed by fire in 1809. Sheridan was assisted by friends, including the prince regent, whose cause he had often supported in parliament. But his ruin was completed when the loss of his seat in parliament, 1812, delivered him into the hands of his creditors, and he died July 7, 1816, with bailiffs in his house. His friends provided for a funeral in Westminster Abbey.

Besides being an honourable politician, an orator, and a playwright, who has added names and phrases to the language, Sheridan was one of the wittiest men of any age. His three daughters, renowned for their beauty, became Lady Dufferin, Mrs. Norton, and the duchess of Somerset. His only son, Thomas (1775-1817), was a poet. See Drama; English Literature; consult Lives, Mrs. Oliphant, 1885; L. C. Sanders, 1890; W. Fraser Rae, 1896; W. Sichel, 1909; L. Gibbs, 1947. The plays were edited by A. W. Pollard, 1900.

Sherif or **SHEREEF** (Arab., noble). Title of the descendants of Mahomet through his daughter Fatima. The governor of Mecca and the sovereign and district governors of Morocco are sherifs. See Hejaz; Hussein; Mahomet.

Sheriff. Public official in England, Scotland, and elsewhere. The word is a corruption of shire reeve, for the first sheriffs were persons appointed by the kings to look after their interests in the various shires. They became powerful, and it was necessary for Henry II to take measures to check them, and to prevent them making their office hereditary. The office is now mainly a ceremonial one.

In England and Wales each county has its high sheriff. He is chosen for one year, three names being submitted to the king, who makes his selection by pricking one name with a silver bodkin. The three are selected by the chancellor of the exchequer, and others on Nov. 12 each year from among landholders in the county. In the cities the sheriff is elected annually by the council. In Scotland the sheriff is a lawyer who receives a salary and presides over the courts of justice. There are sheriffs in certain old English cities, e.g. Bristol, Nottingham, and Norwich, while the city of London has two. The high sheriff is responsible for receiving the judges when on circuit, and has other duties con-

nected with the administration of justice and the return of members to parliament. He usually appoints an under-sheriff, a paid official. (See County; Reeve.)

IN THE U.S.A. A sheriff is a county official, usually elected by popular vote. He must be not less than 21 years of age and resident in the county. His functions approximate in some respects to those of the English police. As readers of American detective fiction have learnt, he is often the first person to whom the discovery of a murder is communicated. He is required to keep peace and order, guard prisoners and juries, attend the sessions of the local courts, and serve their processes and execute their judgments as administrative officer of the law. His main judicial duty is to determine damages or writs of inquiry.

Sheriff, LAURENCE (d. 1567). Founder of Rugby School. Born in or near Rugby, he settled in London as a grocer, and was made an esquire, and given a grant of arms by Elizabeth. Appointed second warden of the Grocers' Company in 1566, he died Oct. 20, 1567, bequeathing considerable estates for the foundation and endowment of a school in Rugby.

Sheriff Court. In Scotland, a court held nominally by the sheriff of a county, but in practice by the sheriff-depute, or substitute. The sheriff has civil jurisdiction in contracts, possessory actions, etc.; also summary jurisdiction in small debt cases and criminal jurisdiction in minor offences.

Sheriffmuir, BATTLE OF. Engagement between the Jacobites and the Hanoverian forces, Nov. 13, 1715. The Old Pretender ordered the earl of Mar to raise an army for him in the north, and 9,000 Highlanders flocked to his standard. Unable or afraid to take the offensive, Mar waited until the Royalist army of some 3,500 regulars, under Argyll, advanced upon him at Sheriffmuir, Perthshire. The battle was stubbornly fought until, unable to gain a decisive victory, Argyll withdrew to Stirling, leaving the Pretender, who had arrived on the field, to enjoy his barren victory.

Sheriff's Tourn or **TURN**. In England, a court of record formerly held by the sheriff twice a year at different places within the county. It corresponded with the court-leet (q.v.), and having long fallen into desuetude, was abolished by the Sheriff's Act, 1887.

Sheringham. Urban dist. and holiday resort of Norfolk, England. It is 4 m. W.N.W. of Cromer, with which it has a rly. connexion. There are golf-links and other



Sheringham, Norfolk. The beach and cliffs from the N.W.

attractions, which have made the place increasingly popular. Near are the remains of Beeston Priory, a religious house which was founded in the 13th century. Pop. est. 4,000.

Sheringham, GEORGE (1884-1937). British artist. He received his training at the Slade School and in Paris, where he first exhibited at the Salon. He gave one-man exhibitions in London, Paris, New York, and Melbourne, and his work is in many permanent collections. Sheringham designed scenery and costumes for plays, and (with James Laver) wrote Design in the Theatre. His adaptation of fluorescent lighting, by which artists could work in artificial light, was called Sheringham daylight. He published Pen and Pencil Drawings, 1922. He died Nov. 11, 1937.

Sherkot. Town of the Uttar union, India, in Bijnor district. Situated on the Kho river, it has a trade in sugar and makes carpets. Two Hindu temples lie outside the town. Pop. 20,100.

Sherman. City of Texas, U.S.A., the co. seat of Grayson co. It is 63 m. N. of Dallas by rly. It is the seat of Austin College, which has a million dollar endowment. The main industry is cotton. Settled in 1848, Sherman became a city in 1895. Pop. 17,156.

Sherman, JOHN (1823-1900). American financier and statesman. Born at Lancaster, Ohio, May 10,

1823, brother of W. T. Sherman, he became a lawyer in 1844. In 1855 he entered the house of representatives, and in 1861



John Sherman

became a member of the senate, wherein he remained until 1877. A member of the Republican party, he became prominent as a financier, and was secretary to the treasury, 1877-81. Again in the senate, 1881-97, Sherman was secretary of state under McKinley, 1897-98. He is chiefly known for the silver law of 1890, called after him, and for a measure against trusts for which he was responsible. Sherman died at Washington, Oct. 22, 1900. Consult his *Reminiscences*, 1895, also *Life*. T. E. Burton, 1906.

Sherman, WILLIAM TECUMSEH (1820-91). American soldier.

Born at Lancaster, Ohio, Feb. 8, 1820, he was educated at West Point. After 13 years in the army he resigned his commission, but on the outbreak of the Civil War he rejoined, and was soon made

a brigadier-general. Sent to Kentucky, he was relieved of his command for asking for 200,000 men, but was reinstated shortly afterwards, and in Feb., 1862, was given the command of the army of Tennessee, and contributed largely to the victory of Shiloh.

During the next two years he assisted Grant in the campaign against Vicksburg, and in the battles around Chattanooga, and also did brilliant work in Mississippi. In May, 1864, he set about the invasion of Georgia, and after defeating Gen. Joseph E. Johnston, began his famous march to the sea. Sherman became c.-in.-c. of the U.S. army in 1869, and died in New York, Feb. 14, 1891. His *Memoirs* appeared in 1875. See *American Civil War*. Consult *Life*, L. Hart, 1930.

Sherman Anti-Trust Act. Act passed by the congress of the U.S.A. on July 2, 1890, during Harrison's presidency. Its first section ran: "Every contract,

combination in the form of trust or otherwise, or conspiracy in restraint of trade or commerce among the several states or with foreign nations is hereby declared to be illegal," and its second pronounced anyone taking part in such contract, combination, or conspiracy to be guilty of a misdemeanour. The act did not have the effect intended. The supreme court sustained several powerful monopolies against attempts by the govt. to break them up, and at the same time held that, in so far as trade unions restrained trade by strikes, they were violating the act. For a time the Sherman Act became virtually a dead letter; it was revived by Theodore Roosevelt, and came to be interpreted as forbidding only restraints and monopolies that the court considered unreasonable. By 1950 the anti-trust div. of the U.S. dept. of Justice, set up to deal with alleged infringements of anti-trust acts, had invoked the Sherman Act about a thousand times.

Sherriff, ROBERT CEDRIC (b. 1896). British playwright and novelist. Born June 6, 1896, he was

educated at Kingston grammar school and New College, Oxford. His play, *Journey's End* (q.v.), brought him fame when it was produced in London 1929. Other plays included *Badger's Green*, 1930; *Miss Mabel*, 1948; *Home at Seven*, 1950. His novels, studies of the middle class, included *Greengates*, 1936; *Chedworth*, 1944, and *Another Year*, 1946. He also worked on the scripts of many films.

Sherrington, SIR CHARLES SCOTT (b. 1861). British scientist. Educated at Caius College, Cambridge,



Sir Charles Sherrington, British scientist

he studied science and medicine. He was made a fellow of his college, and in Cambridge began his work as a physiologist. Professor of physiology in University College, Liverpool, 1895-1913 he was appointed Waynflete professor of physiology at Oxford in 1913. Sherrington held a professorship at the Royal Institution, 1914-17,

and was professor of pathology in the university of London. In 1920 he was president of the British Association, and received the O.M. 1924. His work gained him the Nobel prize for medicine, 1932. His writings include *Mammalian Physiology*, 1916, *Selected Writings*, 1939, *Assaying of Brabantius*, 1939, and *The Endeavour of Jean Fernel*, 1946.

Sherry. White Spanish wine. It is grown in a small region between the mouths of the Guadalquivir and Guadalete, and is named from Jerez, the centre of the sherry industry. The grapes, both red and white, are fully matured, and natural sherry is somewhat harsh. Condensed wine liqueur, sugar, and spirit are usually added, and the resultant wines are blended to the required taste. The two chief varieties are the pale, or dry, and the brown, or sweet. Typical of the former is Manzanilla; of the latter, Oloroso. Amontillado (q.v.), Fino, and Vino de Pasto are other types, while trade names include palma, raya, solera, and palo.

Sherry improves by keeping, and the name East India was formerly applied to sherry which had made a long sea-voyage. It is a delicate, full-bodied wine of rich flavour. See *Madeira*; *Sack*; *Wine*.

Sherwood, ROBERT EMMET (b. 1896). American novelist and playwright. He was born April 4, 1896, and educated at Harvard university. He was a fervent admirer of F. D. Roosevelt, and did much to prepare America's entry into the Second Great War by a nation-wide advertising campaign sponsored by prominent U.S. business men. During the war he was head of the American political warfare division. Among his many highly successful plays are *The Road to Rome*, *Waterloo Bridge*, *The Petrified Forest*, *Idiot's Delight*, *Acropolis*, and *There Shall be no Night*.

Sherwood Forest. Formerly a royal forest in Nottinghamshire. It lay in the W. and N. of the county, stretching W. from Nottingham, as far as Worksop, and including Mansfield, and covering an area of about 200 sq. m. Most of it has been deafforested, but there are remains in the Dukeries. The forest was crown property, and herein King John and other Plantagenet kings had a hunting residence. It is also associated with the exploits of Robin Hood. The old forest included the domains now known as Bestwood, Newstead, and Rufford. The name Sherwood

is now that of one of the northern suburbs of the city of Nottingham. Since the beginning of the 19th century coal pits have been sunk, and Edwinstowe is a mining centre. See Dukeries; Robin Hood.

Sherwood Foresters. Regiment of the British army. Known also as the Nottinghamshire and

Derbyshire Regiment, it was formed in 1881 from the 45th and 56th Foot, which had been raised in 1740 and 1823 respectively. The 45th gained its first honour in the capture of Louisburg in 1763,

and after more than 40 years in Canada, went to the Peninsula, where, attached to Picton's division, it won fourteen battle honours and the nickname Old Stubborns. The regiment had distinguished service in the Burma War, 1824-26, and the Kaffir War, 1846-47, and gained three honours in the Crimea. The 56th Foot spent its early years in India and went back during the Mutiny after having fought in the Crimea.

The combined regiment fought in the Egyptian campaign of 1882 the Tirah expedition, and major engagements of the S. African War. Thirty battalions of the Sherwood Foresters were raised for service in the First Great War and gained the honours: Aisne, 1914,'18; Neuve Chapelle; Loos; Somme, 1916,'18; Ypres, 1917,'18; Cambrai, 1917,'18; St. Quentin Canal; France and Flanders, 1914,'18; Italy, 1917,'18; Gallipoli 1915. In the Second Great War, the Sherwood Foresters gained distinction in France (1940), N. Africa, and at the Anzio and Salerno landings. The regimental depot is at Derby.

Sheshuan. CHESHAWEN, OR XEHAUEN. Holy city of Spanish Morocco. It is 30 m. direct S. of Tetuan. Built in 1471 by fanatics headed by Malai Ali Ben Rachid, whose mosque is the principal building, in order to be isolated from the spread of Christian civilization it was for many centuries a secret city, a natural barrier of mountains surrounding it. Until 1920, when captured by Spanish troops, it had never been penetrated by white men. It has many mosques and bazaars. Pop. 12,397.

She Stoops to Conquer. Five-act comedy by Oliver Goldsmith, produced at Covent Garden Theatre, March 15, 1773, and published immediately after with the full

title, *She Stoops to Conquer, or The Mistakes of a Night*. This delightfully humorous play, in which Tony Lumpkin and Kate Hardcastle are famous characters, was one of the first effective blows against the fashionable genteel or sentimental comedy, the overthrow of which was completed by Sheridan's *School for Scandal* (q.v.).

Shetland or **ZETLAND.** Group of islands off the N. coast of Scotland. The Orkneys lie between them and the mainland. They form a county, and with the Orkneys send a member to parliament. They number about 30, and in addition there are some 70 uninhabited islets. The area is 551 sq. m. The largest island is Mainland; others are Yell, Unst, Fetlar, Bressay, Whalsay, Trondra, East and

plane and naval base and formed part of the chain of radar warning stations upon which depended the air raid defence of Great Britain. Frequently raided by German aircraft, they were the target of the first bombs to fall on British soil. Nov. 13, 1939, when the only casualty was the famous rabbit which German propaganda magnified into a cruiser. The rabbit was later dropped over Germany by the R.A.F., addressed Field-Marshal Goering. Consult S. and the Shetlanders, W. P. Livingstone, 1947.

Shetland Pony or **SHELTY.** Smallest British breed of horse. It is produced in the Shetland Isles and by some authorities is considered to be the direct descendant of the British horse of prehistoric times. The sheltie stands from 9 to 11 hands high, with rough shaggy mane and forelock that almost conceal the small head. The usual colour is either bay, brown, or a rusty black. It is a powerful little beast, capable of carrying heavy weights and of continuous exertion. See Horse colour plate; Pony.

Shetleston. Residential suburb of E. Glasgow, Scotland. Formerly a small weaving village, it became dependent principally on coal mining. The parish has a pop. of some 50,000, and returns one M.P.

Shibboleth (Heb., ear of corn, flood). Password of the Gileadites under Jephthah, at a ford of the Jordan, during their war with the Ephraimite invaders (Judges 12, r. 6). Because of a defect in speech, the fleeing Ephraimites pronounced the word sibboleth, thus betraying their identity, and were subjected to great slaughter. The word has come into general use as a derogatory term for the watchword or pet phrase of a political or other party or class.

Shiel. Loch or lake of Scotland. Forming part of the boundary between Inverness-shire and Argyllshire, it extends from Glenfinnan in a S.W. direction for 17 m. and has a breadth of 1 m. and a



Shetland. Map of the group of islands off the north coast of Scotland

West Burra, Mousa, and Foula. Fair Isle is the most southerly. On Mainland are Strom Loch and other lakes. The chief industries are breeding cattle and sheep, and fishing. Oats, barley, and potatoes are grown, and poultry are kept on the holdings of the crofters. Shetland ponies are bred. Lerwick is the capital, having superseded Scalloway, a fishing village. Pop. est. 20,200.

The islands are thought to have been the Ultima Thule of classical writers. They were part of Norway from 875 to 1468, when they were ceded to Scotland. In 1764 they became the property of the Dundas family, who take from them, in the form of Zetland, the title of marquess. In the Second Great War the Shetlands were a sea-



Shiel. The Scottish loch, with monument where the Young Pretender unfurled his flag in 1745

greatest depth of 420 ft. Its surplus waters are discharged by the river Shiel through Loch Moidart to the sea. At Glenfinnan a monument marks the spot where Prince Charles Edward unfurled his banner, Aug. 19, 1745.

Shiel, MATTHEW PHIPPS (1865-1947). British novelist. He was born at Plymouth, Montserrat,



M. P. Shiel,
British novelist

July 21, 1865, the son of M. D. Shiell, a shipowner, who induced the bishop of Antigua to crown his son king of the unclaimed neighbouring isle of Redonda on his 15th

birthday. Educated at Harrison College, Barbados, and King's College, London, Shiel was for a time a mathematics teacher and a medical student. Thanks to encouragement from Mrs. Gladstone, he wrote *Prince Zuleski*, which appeared as his first book in 1895. Several novels quickly followed, of which *The Yellow Danger*, 1898, was the most distinctive. In 1901 appeared the memorable *The Purple Cloud*; later novels were *Children of the Wind*, 1923, and *How the Old Woman Got Home*, 1927. Other books were written in collaboration with his biographer, John Gawsworth, who was designated his successor to the throne of Redonda and who edited *The Best Short Stories of M. P. Shiel*, 1947. Shiel died Feb. 17, 1947.

Shield (A.S. scild). Piece of defensive armour, usually carried on the left arm. Though apparently unknown in the Stone Age, and among very primitive peoples, its use in various forms was widespread until the introduction of firearms, and still survives in remote parts of the world. The materials were chiefly wood, hide stretched over a wooden or wicker frame, and metal. In the late Minoan Age of Crete, large convex shields, covering the whole body, were used. The shield of the Bronze Age, long retained as the target of the Highlands and elsewhere, was round with a central boss and numerous studs. It was one type of Homeric shield, another being the long figure-of-eight shield that is represented on early vases.

In classical times the Greek shield was often round, with a leather apron hanging from it. Roman legionaries carried an oblong convex shield (*scutum*) of

wood and leather with a metal rim. Smaller round shields were the *clipeus* of bronze and the *parma* of leather. In medieval Europe many types were common, those of the early Germans being large and oblong. The Normans of the 11th century used the kite-shaped shield from which was developed the form familiar in heraldry. See Africa; Armour; Celt colour plate; Dinka; Greek Art.

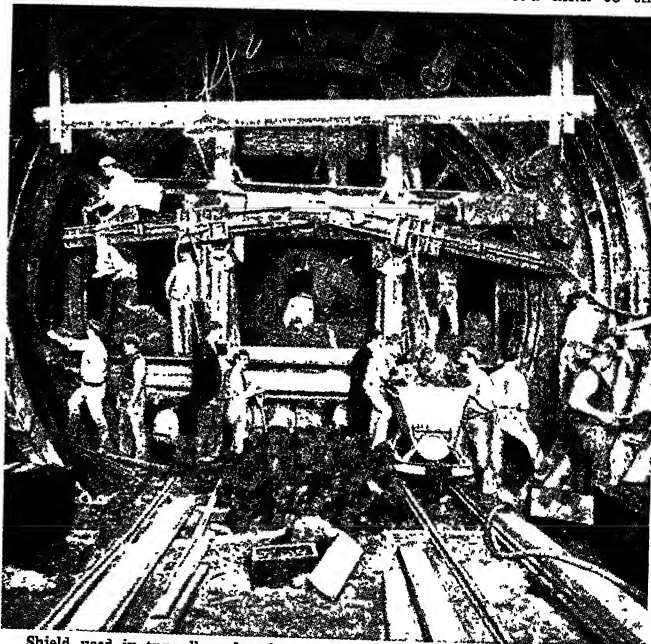
Shield. In engineering, elaborate mechanical device used in tunnelling operations. The shield is used in particular when the tunnel has to pass through water-bearing strata, below the beds of rivers, etc. It consists essentially of a steel-plate cylinder, with a powerful cutting edge at the forward end. The rear end of the shield overlaps the completed tunnel lining. By hydraulic rams the shield is forced slowly forward, and the earth excavated through openings in the end of the cylinder. Compressed air is generally used with the shield to equalise the pressure of water trying to enter. See Greathed Shield; Tunnel.

Shield or Escutcheon. In heraldry, the field on which the charges and ornaments constituting arms are blazoned. Its shape varied with fashion, and highly decorative shields were occasionally employed. The Norman shields were of two types, the kite

and the pear-shaped, with straight or rounded top.

Knights banneret displayed their arms on square shields, representing their square military banners. Ladies place their arms on diamond-shaped shields, heraldically known as lozenges. British heralds insisted on "illegitimate" arms, traders' marks, and other non-registered devices, being displayed on round targets. But on the Continent both round and oblong shields were, and still are, much used. The Spanish royal arms were almost invariably placed on an oval. See Heraldry; Tournament.

Shields, NORTH. Seaport and market town of Northumberland, England, part of the county borough of Tynemouth. It stands at the mouth of the Tyne, on the bank of the river opposite S. Shields, being 8 m. W.N.W. of Newcastle. It is served by rly. and a steam ferry connects it with S. Shields. There are docks from which coal and many other products are exported. Other industries are shipbuilding and the manufacture of cables, anchors, chemicals, rope, etc., as well as light engineering industries on the W. Chipton trading estate. It is also the most flourishing fishing port between the Humber and Aberdeen. The name Shields is derived from a word akin to the



Shield used in tunnelling for the London tube railways, showing workmen excavating through the opening of the shield, which has been forced forward by hydraulic pressure

Gaelic shieling, meaning a hut, and is due to the fact that the fishermen of the Tyne built a number of huts here. See Tynemouth.

Shields, *Southern*. County borough and seaport of Durham, England. It stands at the mouth of the Tyne, on the S. bank of the river, opposite N. Shields. It is 8 m. W. of Newcastle and is served by rly., while a steam ferry crosses the river here. The chief church is S. Hilda's, rebuilt except for its tower. Other public buildings include the town hall and municipal buildings, the latter a 20th century acquisition. There are a free library and museum, custom house, and marine school.

One of the Tyne ports, S. Shields has a harbour accessible to the largest vessels, and protected by a large breakwater, a mile long and called the south pier, and by another called the north pier. Connected with it are extensive docks and wharves. The industries include the mining and shipping of coal, the manufacture of clothing, biscuits, chemicals, boilers, iron and brass products, radio components, cables, etc., and ship-building and ship repairing yards. It was at one time a centre of the salt industry. The Lawe, an eminence in the town, was the site of a Roman station. In 1851 South Shields was made a corporate town. One member is returned to parliament. Market day, Sat. Pop. 103,130.

Shifnal. Market town of Shropshire, England. It is 17 m. E.S.E. of Shrewsbury and 154 m. N.W. of London, with a rly. station. The chief building is S. Andrew's church, a fine cruciform edifice, with a little Norman work. Features are the Moreton chapel and a number of monuments. The town has several interesting old houses. The industries include blast furnaces and iron foundries, and around are coal and ironstone mines. There is also a trade in cattle. The early name of Shifnal was Idsall. Near by are Tong Castle, Boscobel, and White Ladies. Market day, Mon. Pop. 3,660. See Tong; White Ladies.

Shigatze or *DIGARSKI*. Town of S. Tibet. Near the junction of the Nyanchu and Tsangpo, it is situated at an alt. of 12,000 ft. It contains the Tashi-lunpo, the residence of the Tashi Lama. This monastery was founded in 1445.

Shiites or *SHIAHS* (Arab. *shi'ah*, party). One of the two chief divisions of Mahomedans, the other being the Sunnis or Sunnites. They regard Ali, cousin of Maho-

met, as the Prophet's first true successor, and observe the anniversary of Ali's assassination with special reverence. The more cultured among the Shiites, who are more numerous in Persia than elsewhere, do not believe in the story that passages of the Koran favourable to Ali were omitted by Zaid or Usman. See Ali; Hasan; Kerbelā; Mahomedanism.

Shikari (Hind., hunter). Anglo-Indian term for a hunter of big game. It is applied alike to the European sportsman and to the trained native who assists him.

Shikarpur. Town of Pakistan, in the dist. of Sukkur, Sind province. It is 18 m. from the right bank of the Indus; is the starting-point of an ancient trade route through the Bolan Pass to Afghanistan and E. Persia; and is on the modern strategic rly. which follows the same route to Baluchistan. Carpets and coarse cottons are manufactured. Pop. 62,746. Smaller towns of the same name in India are (1) S. in Bulandshahr dist., the United Provinces, and (2) S. in Shimoga dist., in Mysore.

Shildon. A market town of Durham, England. It is 9 m. N.E. of Darlington, with a rly. station. The main industries are railway wagon repairing, coal mining, and light engineering. Market day, Fri. Pop. 14,550.

Shilka. River of E. Siberia, in the Mongol-Buryat A.S.S.R. It is one of the two upper branches of the Amur, formed by the union of the Onon, which rises in the Altai Mountains, and the Ingoda. After a course of 450 m. it joins the Argun, and forms the Amur. It is frozen from Nov. to May.

Shillelagh or *SHILLALY*. Irish cudgel, generally of blackthorn or oak. It is supposed to derive its name from Shillelagh in Co. Wicklow, Eire, famous for its oaks. *Pron.* Shi-lay-li.

Shilleto, *RICHARD* (1809-76). British classical scholar. He was born at Ulleskelf, Yorks, Nov. 25, 1809, and educated at Repton, Shrewsbury, and Trinity College, Cambridge. He became a coach, and had as pupils many outstanding scholars of his time. Shilleto himself was one of the greatest Greek scholars England has produced. Demosthenes, Thucydides, and Aristotle were his special studies. He spent his whole life in Cambridge, was elected fellow of Peterhouse in 1867, and died Sept. 24, 1876.

Shillibeer, *GEORGE* (1797-1866). British coachbuilder. Born in

London, he served in the navy, learnt coachbuilding in Long Acre, started a business in Paris, and in 1829 introduced and gave its name to the first omnibus in London, starting a service from Paddington to the Bank, with coaches holding 22 passengers. Later he became an undertaker, and invented a funeral coach known as a shillibeer. He died at Brighton, Aug. 22, 1866.

Shilling. British coin. It is derived from the Anglo-Saxon silver scyelling, which had a value



Shilling. Obverse and reverse sides of the British coin. Top, shilling of Henry VII

of about 5d.; this was indented with a cross along the lines of which it could be broken into four pieces; whence the word farthing (fourth part). The shilling equal in value to 1/20th of a £ or to twelve pence was first struck in 1504. In Charles II's reign it was given a milled edge. The lion device on the reverse was introduced for George IV. When first coined, the shilling consisted of 925 parts of silver to 75 of other metals, but its fineness was reduced to 500 parts of silver by the Coinage Act of 1920. By the Coinage Act of 1946, the silver shilling was withdrawn and replaced by a coin with a standard composition of 75 p.c. copper and 25 p.c. nickel. See Coinage; Numismatics.

Shillong. Capital of Assam, India, and h.q. of the subdivision of the Khasi and Jaintia Hills. It is 4,900 ft. above sea level and about 63 m. S. of Gauhati on the Brahmaputra. The entire town was wrecked by an earthquake in 1897, was rebuilt, and is picturesquely laid out amid pinewoods. Average rainfall is 81 ins. annually. Here are a Pasteur institute, a Welsh Presbyterian mission, and B.C. colleges and schools. Pop. 27,000.

Shillong first became capital of Assam under British rule in 1874.

In 1905, on the creation of the prov. of Bengal and Assam, it lost part of that status, as Dacca (now in Pakistan) became the cold weather capital, Shillong remaining the summer h.q. of government. In 1912, when Assam again became a separate prov., Shillong was restored to full capital rank. During the Second Great War it was a centre of communication, and on the transfer of power from British to Indian hands in 1947 its significance increased as the capital of a frontier prov. bordering Tibet, China, Burma, and Pakistan.

Shilluk. Nilotic negro people. They are mostly found on the grasslands of the W. Nile bank in the Upper Nile prov., Sudan. With the largest Hamitic strain of all the Nilotes, they are dark, woolly-haired, long-headed, 5 ft. 10 ins., of Nilotic speech, and present the most compact political organization of any Sudanese people. They breed cattle and sheep. Their rain-maker chiefs, deemed to incarnate the semi-divine legendary founder Nyakang, were until recent times ceremonially slain, with their own consent, when advanced in age.

Shiloh. Town of Palestine. Between Bethel and Shechem, it is about 19 m. N. of Jerusalem, and is now known as Seilun. It was the resting-place of the Ark of the Covenant in the days of Samuel.

Shiloh, BATTLE OF. Battle of the American Civil War fought near Pittsburg Landing on the river Tennessee, April 6-7, 1862. Its name is derived from Shiloh church, where the Confederates under Johnston had concentrated. The Federals were under Grant. On Sunday, April 6, the Confederates attacked Sherman's division which formed Grant's right flank near this church, and in a few hours threw back the entire Federal line (33,000 men) towards the Landing.

Grant arrived post haste from Savannah after ordering Buell's advanced guard to cross the river at Pittsburg. Meanwhile the success of the Confederates had been dearly purchased by the death of Johnston. The fighting died away at nightfall, through exhaustion of the troops on both sides. Grant reinforced his left with the divisions of Nelson, McCook, and Crittenden (20,000 men), and at 6 a.m. the Confederates, reduced by losses to less than half their original numbers, were assailed by the force they deemed defeated. By 2 p.m. the Confederates were back five miles, and the Federals were again in possession of Shiloh. Nearly 25,000 men fell in this battle.

Shimoga. Dist. and town of Mysore, India. The dist. lies in the N.W. of the state, adjacent to Bombay state. It is crossed by the rly. N.W. from Bangalore. Only a third of the area is cultivable and but a fifth is tilled, mainly for rice and ragi. Area, 4,058 sq. m. The town is on the Tunga, 171 m. N.W. of Bangalore, and is convenient for visiting the Gersoppa Falls. Iron and steel works opened in 1923 at Bhadravati have the only plant for wood distillation in India. Pop., dist., 551,149; town, 27,712.

Shimonoseki or **AKAMAGASEKI.** Fortified town and seaport of Japan. It stands at the S.W. end of Honshu, opposite Kyushu, on the Strait of Shimonoseki, the W. outlet of the Inland Sea, and is the W. terminus of the rly. extending from Tokyo along the S. coast. Opened to foreign trade in 1890, it is an important commercial town with a secure and capacious harbour. In 1863 it was bombarded by the united squadrons of Great Britain, France, the U.S.A., and the Netherlands. Here in 1895 was concluded the treaty with China by which Japan acquired Formosa and the Pescadores (qq.v.). Engineers blasting a tunnel between Honshu and Kyushu met in the middle of the strait on April 19, 1939. Pop. 132,737.

Shin. Loch of Sutherland, Scotland. It is 17 m. long, $\frac{1}{2}$ to $1\frac{1}{2}$ m. broad, and 161 ft. deep. Its surplus waters discharge into the river Shin, on which stands Lairg.

Shinar, PLAIN OF. District of Babylonia, mentioned in the Bible. According to some authorities it was situated in the S. of Babylonia, but others place it in the N.

Shingle. Rounded water-worn material found on the seashore. It is usually distinguished from gravel which is composed of much smaller particles. The word is used for thin pieces of wood used in roofing (v.i.). The Shingles is a sandbank between the Isle of Wight and Hurst Castle, $2\frac{1}{2}$ m. long.

Shingle. Roofing unit of wood, widely used in America and Scandinavia. Old shingles were of oak and pine, but most contemporary examples are of Western red cedar, which contains a natural preservative oil. These are imported into Great Britain. The best shingles have a life up to 60 years, are of light weight, moderate cost, and go a pleasant silver grey colour through weathering. They are nailed to battens and lapped on pitched roofs, like tiles.

Shingle. Style of women's hairdressing, in which the hair was

cut close to the back of the head. This was popular in the 1920s.

Shingles. Acute eruption on the skin characterised by the appearance of groups of small vesicles. See Herpes.

Shingling. In metallurgy, the process of bearing or squeezing impurities out of "blooms" (q.v.) and consolidating them. In making wrought iron, whether direct from ore or from pig iron, the masses—"balls" or "blooms"—as they come from the furnace, the refinery, or the forge, are loose and spongy and contain much slag more or less molten. Shingling drives out the impurities and consolidates the blooms into a condition which makes them fit to be passed on to the next stage, the forge train. Formerly shingling was done by tilt or helve hammers, still used in some regions, but is now generally done by steam hammers or hydraulic presses. See Helve; Iron; Wrought Iron.

Shintoism (Chin. *shin-tao*, way of the gods). Religion of Japan. Of unknown antiquity and primitive type, it appears to be of native origin, though it has affinities with N. Asiatic Shamanism, and has been overlaid with Buddhist and Confucian practices and ideas. Its crude mythology and cosmogony are recorded in the Kojiki, written 712. The numerous divinities are (1) powers of nature, like the sun, the earth, fire, rain-storm; (2) deities presiding over human affairs, e.g. the food-goddess; (3) abstractions, such as growth; (4) deified men, like Temmangu, god of learning, originally the 9th century sage, Michizane. The chief deity is Amaterasu, the sun-goddess. From her the emperors claimed descent, and therefore up to the occupation of Japan by the Allies were venerated as divine.

There are no idols, but the souls of the gods are held to inhabit chests in the temples, containing sacred emblems, generally a sword, mirror, or jewel. Worship takes the form of offerings, prayers for temporal blessings, litanies read by the priests, and dances. Pilgrimages are frequent, and there are annual festivals, as at harvest. Twice a year there is a day of purification of the people. Simplicity and austerity characterise Shinto ritual.

Ethically the religion is little developed. Reverence for ancestors and loyalty to the state are enjoined. The human heart is held to be essentially good. Purity, to which great importance is attached, is little more than the avoidance of

ceremonial uncleanness. The spirit passes at death into the shadowy world of Yomi, from which it exerts an influence over posterity.

In the 18th century, Shintoism began to reject Buddhist accretions, and became again a political force, which contributed to the movement for the restoration of the temporal power of the mikado. After the revolution of 1868 the government encouraged Shintoism at the expense of Buddhism. Shintoism as a state religion was abolished by a directive from Gen. MacArthur, Allied c.-in-c., Dec. 15, 1945. See Japan.

Shinty OR CAMANACHD. Ancient game of the Scottish Highlands, intermediate between hurling and hockey. The field of play varies from 250 yds. to 140 yds. in length and 100 to 70 yds. in width. The goals, termed hails, are 12 ft. wide and 10 ft. in height, backed by a netting. A goal is scored by the ball being hit between the hails and passing into the netting. There are 12 players on a side, distributed over the field much in the manner of an Association football team. The ball, consisting of a cork core bound with worsted and covered in leather sewn with coarse seams, is about 2 ins. in diameter and weighs between 3 and 4 oz. The caman or club for striking the ball has a triangular head. A game occupies one hour and a half, with five minutes' interval at half-time. The controlling body is the Camanachd Association.

Shinwell, EMANUEL (b. 1884). British politician, born Oct. 18, 1884. Though a Londoner, he was



E. Shinwell,
British politician

M.P. for Linlithgow 1922-24 and 1928-31. He was secretary for mines in the first Labour government, also in 1930-31 after a brief term as financial secretary to the war office. In a remarkable election at Seaham in 1935 he defeated by more than 20,000 votes Ramsay MacDonald, then second-in-command of a national government. He refused a post in Churchill's war govt., but became minister of fuel and power 1945, passing through the Act nationalising the coal industry in 1946. In 1947 he was made war secretary. Elected, 1950, by the new constituency of Easington (including Seaham), he became minister of defence.

SHIP AND SHIPBUILDING

Frank C. Bowen, Author of *The Golden Age of Sail, etc.*

The history of sea-going vessels as here related from their earliest known beginnings in Crete and is followed by a description of contemporary shipbuilding. See Clipper; Dock; Galleon; Liberty Ship; Lloyd's Register; Navy, and other associated subjects; also Battleship; and under the names of famous ships—e.g. Comet; Golden Hind; Great Eastern; Normandie; Queen Elizabeth; Santa Maria

The term ship is usually applied to any fair-sized decked vessel that can be worked in the open sea, as opposed to a small open boat; but strictly a ship is a sailing vessel with more than two masts, square-rigged on all of them. The term has changed its significance with the ages and was formerly applied only to the largest vessels, irrespective of rig. The date when the dug-out canoe made from a single tree trunk, or the raft supported by inflated skins, both of them suitable only for river or lagoon work, developed into the vessel able to make coastal and then overseas passages is unknown; but the Cretans are generally given the credit for being the first deep sea mariners, perhaps from as far back as 4000 B.C. or even earlier until the catastrophe, probably about 1100 B.C., which ended their prosperity. In the meantime the Egyptians had developed their spoon-shaped Nile boats, whose construction was limited by the short lengths of the acacia wood of which they were built, into sea-going ships of considerable size, built of imported timber. The Egyptians also built war galleys, but they were not natural seamen and preferred to leave long distance journeys to subject races.

The people of the Phoenician ports on and off the coast of Syria, who are believed to have originated in the Persian Gulf, came into prominence as shipbuilders and sailors soon after 3000 B.C., and for long received the credit for earlier work done by the Cretans. Their ships, undoubtedly the finest of their age, were taken across the Mediterranean and into the open Atlantic, although their captains probably hugged the coast and beached them in bad weather or at night whenever possible. There is evidence that they were carvel-built—the planks placed edge to edge—and relied on their sails rather than oars for propulsion, but the Phoenicians maintained such close secrecy concerning all their doings that there is no definite evidence of their design. The Greeks also had ships of burden, which collected Black Sea grain in exchange for wine and pottery, while the Romans, al-

though preferring to leave merchant shipping in the hands of subject races, had developed a fine type of seagoing ship, with an elaborate sail plan on very practical lines, by the beginning of the Christian era. The biggest of these were the ships carrying tribute grain from Egypt, which could carry a large cargo as well as numerous passengers. S. Paul's ship was typical of those vessels.

Ships of the Northern Countries

In the N. a different type of vessel was developed, which was centuries later than the Mediterranean types in adopting sail. They were all clinker or clench-built—the planks over-lapping—with keel and frames making a strong skeleton instead of being only a reinforcement of the planking. Caesar specially mentioned the strength of the ships which he found on the N. coast of Gaul. From an early date their double-ended hulls had a big sheer both forward and aft for seaworthiness in the rougher waters of the N., and from them developed the Viking ships which made voyages to Iceland, Greenland, and even Vinland, on the mainland of N. America.

In both the N. and the Mediterranean there were long ships for fighting and piracy, and round ships for trading; but the greatest different influence on design, apart from the heavier weather to be expected, was that the northern ships were rowed by free fighting men and not by slaves, as in the Mediterranean.

In the N. the Viking type of hull persisted for centuries, latterly easily converted into a warship by the addition of fighting castles forward and aft and at the top of the mast, although certain modifications were introduced through the seamen's observations in the Mediterranean during the Crusades. Although there is no definite evidence, according to contemporary stories the three-masted Turkish dromon, which was finally sunk by Richard I's Crusaders after they had found her sides too high for boarding, was big enough to carry 1,500 men.

In the S. the galley type of ship persisted, both for fighting

and also for carrying fine cargoes, with high value on a small weight, from the Mediterranean countries and also brought overland from the E. to Syria, Egypt, and Constantinople. The big Venetian trading galleys made annual voyages to Britain and Flanders with valuable cargoes of wines,

others, proved invaluable in finding the sea route to the E. by way of the Cape of Good Hope, but it was unsuitable for crossing the Atlantic, for which the galleon type, square-rigged on two masts and with a fuller body, was more satisfactory. Columbus's ship, the *Santa Maria*, was an ordinary square-rigged vessel of her day, the replica built in 1892 from

their towering ends were the more serviceable, but in Elizabeth's day the former were in greater favour and, manned by fighting sailors, showed their superiority over the high-charged Spanish ships manned by soldiers at sea in the Armada fighting. The great difference had been made by the introduction of the heavy muzzle-loading gun, placed low in the ship and firing through a port, which could damage or sink a ship, whereas the earlier breech-loading guns were useful only against her personnel on deck. Heavier guns made greater strength of hull necessary; this was partly secured by introducing the tumble-home, or inward slope of the sides; but the absence of a continuous strength deck, forming a girder with the keel and frames, was long a source of weakness.

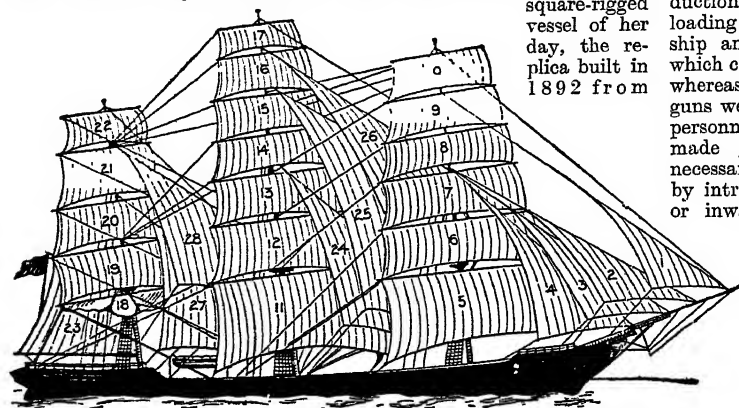
As longer voyages became common, the design and construction of ships improved rapidly, the teaching of scientific naval architecture in France under Colbert having a big influence. The ship rig, originating with the square mizzen topsail to facilitate

station-keeping in convoy, was developed, and design was more specialised for various purposes.

During the 17th century, and even earlier, a number of inventions were put forward which have been claimed as the predecessors of the steamship, but in every case there is grave doubt. The specifications of the patents or grants were generally very vague and most of the inventions were probably paddles or some other form of propulsion driven by man or animal power, a revival of the principle tried by the Romans.

Ships of the 18th Century

The 18th century, with its colonial development and almost continuous wars, accelerated improvement in ship design and construction. Hulls were built suitable for voyages to any part of the world. The sail plan was made more scientific and designers began to study such factors as the centre of effort. The staying of masts was carefully thought out and dismasting was reduced, while speed was greatly increased, although principally for privateering, smuggling, or slaving. At the end of the century there was a great increase in the size of ships, especially men-of-war and East



Jib sails. 1. Flying jib. 2. Outer jib. 3. Inner jib. 4. Jib. Foremast. 5. Foresail or fore course. 6. Lower fore topsail. 7. Upper ditto. 8. Lower fore topgallant sail. 9. Upper ditto. 10. Fore royal. Mainmast. 11. Mainsail or main course. 12. Lower main topsail. 13. Upper ditto. 14. Lower main topgallant sail. 15. Upper ditto. 16. Main royal. 17. Main skysail. Mizzenmast. 18. Crossjack. 19. Lower mizzen topsail. 20. Upper ditto. 21. Mizzen topgallant sail. 22. Mizzen royal. 23. Spanker. Staysails. 24. Main topmast staysail. 25. Main topgallant staysail. 26. Royal staysail. 27. Mizzen topmast staysail. 28. Mizzen topgallant staysail.

Ship. Diagram indicating the names and positions of the sails of a ship-rigged vessel

spices, silks, and glass, but Genoa, defeated at sea and finding it difficult to secure galley slaves, replaced the galley by high freeboard sailing carracks. In the N. the high freeboard sailing ships of various types—cogs, carracks, nefes, hulks, all designed to carry big cargoes—were in general use, although for many years the Hanseatic league had a virtual monopoly of them and by force of arms prevented the English from building and running them.

Sailing the World

The 15th century was the great turning point of naval architecture. The longer voyages permitted by growing knowledge of the world, understanding of the compass and its variation, and the improved methods of navigation, not only demanded ships large enough to carry the necessary victuals, water, and cables, but also ships which could be sailed nearer the wind than the older types. To the single mast of the N. was added a second, and immediately afterwards a third, and the topsail was revived after being neglected since Roman days. The Iberian caravel, developed from a Portuguese coaster with square sails on the foremast and fore-and-aft canvas on the

faked plans supposed to have been discovered in a Spanish dockyard being really a typical ship of the late 16th century. In the Mediterranean the galley design was blended with that of the high freeboard sailing ship to make the galleasse.

By the time, under the Tudors, that English ships became prominent, the world's most profitable trades were subject to national monopolies, so that ships of English traders on the long distance voyages had to be built to defend themselves and to take the offensive when necessary. The capital required for building such ships was raised by companies—e.g. the Russian, the African, the Levant, and the East India—to which the crown granted charters and monopolies. These ships could carry sufficient arms to make them invaluable also to the navy. The ships of the Gentlemen Adventurers were equally useful, and although their carrying capacity was small it was sufficient for spice cargoes, or loot taken from the Spaniards.

In the latter part of the 16th century there was great argument as to whether the handier ships of comparatively low freeboard or the "high-charged" ships with

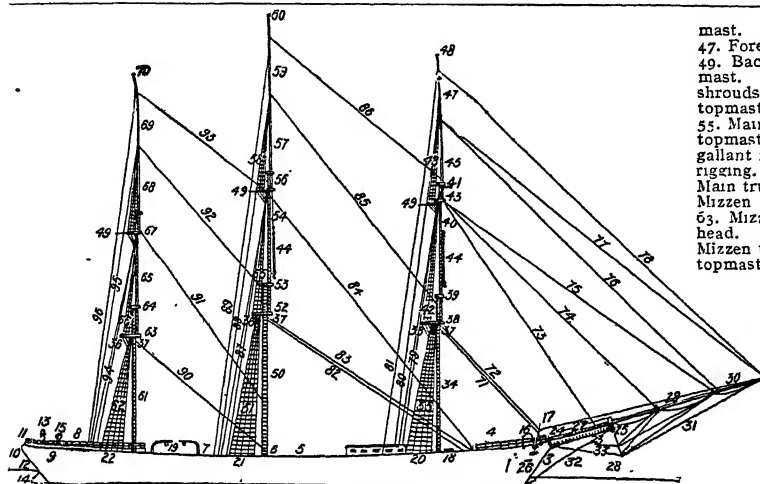
Indiamen. The E. India co. was forced to build bigger ships, increasing the normal size from under 1,000 to as much as 1,500 tons between 1786 and 1797, while in the scarcity of naturally

bent timber it had to resort to iron knees with unexpected success, leading to other means of obtaining much stronger ships.

In the 18th century experiments in various countries were gradually

working towards a practical steamer, although none of them could claim much success. Iron hulls were tried for barges.

In the 19th century the French wars caused technical development



Hull and Standing Rigging. *Hull:* 1. Bow. 2. Cutwater. 3. Stem. 4. Fore-castle. 5. Waist. 6. Gangway. 7. Quarterdeck. 8. Poop. 9. Quarter. 10. Stern. 11. Taffrail. 12. Counter. 13. Wheel. 14. Rudder. 15. Binnacle. 16. Cathead. 17. Anchor. 18. Sidelight box. 19. Boat davits. 20. Fore chains. 21. Main chains. 22. Mizzen chains.

Bowsprit: 23. Bowsprit. 24. Gammowing (i.e. bowsprit lashing). 25. Bowsprit cap. 26. Cable. 27. Bow-

sprit shrouds. 28. Dolphin striker. 29. Jib-boom. 30. Flying jib-boom. 31. Martingale stays. 32. Bobstays. 33. Martingale.

Masts, etc.: 34. Foremast. 35. Foremast rigging or shrouds. 36. Futtock shrouds. 37. Lubber's holes. 38. Fore-top. 39. Fore mast head. 40. Fore topmast. 41. Fore topmast head. 42. Fore topmast rigging. 43. Fore topmast crossrees. 44. Burtons and pendants (tackle for tightening the upper shrouds). 45. Fore topgallant

mast. 46. Fore topgallant rigging. 47. Fore royal mast. 48. Fore truck. 49. Backstay outriggers. 50. Main-mast. 51. Mainmast rigging or shrouds. 52. Main top. 53. Main topmast head. 54. Main topmast. 55. Main topmast rigging. 56. Main topmast crossrees. 57. Main topgallant mast. 58. Main topgallant rigging. 59. Main royal mast. 60. Main truck. 61. Mizzen mast. 62. Mizzen mast rigging or shrouds. 63. Mizzen top. 64. Mizzen mast head. 65. Mizzen topmast. 66. Mizzen topmast rigging. 67. Mizzen topmast crossrees. 68. Mizzen topgallant mast. 69. Mizzen royal mast. 70. Mizzen truck.

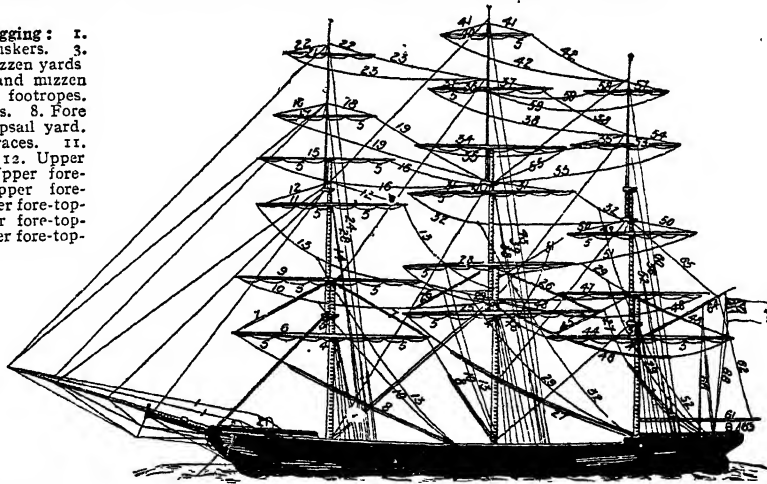
Stays: 71. Fore preventer stay. 72. Fore stay. 73. Fore topmast stay. 74. Inner jib stay. 75. Outer jib stay. 76. Fore topgallant stay. 77. Flying jib stay. 78. Fore royal stay. 79. Fore topmast backstays. 80. Fore topgallant backstays. 81. Fore royal backstays. 82. Main preventer stay. 83. Main stay. 84. Main topmast stay. 85. Main topgallant stay. 86. Main royal stay. 87. Main topmast backstay. 88. Main topgallant backstay. 89. Main royal backstay. 90. Mizzen stay. 91. Mizzen topmast stay. 92. Mizzen topgallant stay. 93. Mizzen royal stay. 94. Mizzen topmast backstays. 95. Mizzen topgallant backstays. 96. Mizzen royal backstays.

The yards and braces are omitted from the above diagram

Yards and Running Rigging: 1. Jib-boom guys. 2. Whiskers. 3. Slings of fore, main and mizzen yards. 4. Goosenecks of main and mizzen yards. 5. Sturrop and footropes. 6. Fore yard. 7. Fore lifts. 8. Fore braces. 9. Lower fore-top-sail yard. 10. Lower fore-top-sail braces. 11. Upper fore-top-sail yard. 12. Upper fore-top-sail lifts. 13. Upper fore-top-sail braces. 14. Upper fore-top-sail halliards. 15. Lower fore-top-gallant yard. 16. Lower fore-top-gallant braces. 17. Upper fore-top-gallant yard. 18. Upper fore-top-gallant lifts. 19. Upper fore-top-gallant braces. 20. Upper fore-top-gallant halliards. 21. Fore royal yards. 22. Fore royal lifts. 23. Fore royal braces. 24. Fore royal halliards. 25. Main yard. 26. Main lifts. 27. Main braces. 28. Lower main top-sail yard. 29. Lower main top-sail braces. 30. Upper main top-sail yard. 31. Upper main top-sail lift. 32. Upper main top-sail braces. 33. Upper main top-sail halliards. 34. Lower main topgallant yard. 35. Lower main topgallant braces. 36. Upper main topgallant yard. 37. Upper main topgallant lifts. 38. Upper main topgallant braces. 39. Upper main topgallant halliards. 40. Main royal yard. 41. Main royal lifts. 42. Main

royal braces. 43. Main royal halliards. 44. Cross-jack yard. 45. Cross-jack lifts. 46. Crossjack braces. 47. Lower mizzen top-sail yard. 48. Lower mizzen top-sail braces. 49. Upper mizzen top-sail yard. 50. Upper mizzen top-sail lifts. 51. Upper mizzen top-sail braces. 52. Upper mizzen top-sail halliards. 53. Mizzen topgallant yard. 54. Mizzen topgallant lifts. 55. Mizzen topgallant

braces. 56. Mizzen topgallant halliards. 57. Mizzen royal yard. 58. Mizzen royal lifts. 59. Mizzen royal braces. 60. Mizzen royal halliards. 61. Spanker boom. 62. Spanker boom topping lift. 63. Spanker sheet. 64. Spanker gaff. 65. Spanker gaff lift. 66. Spanker vangs. 67. Bumpkin. 68. Signal halliards. Skysail rigging is not indicated



SHIP: DETAILS OF HULL AND RIGGING OF A THREE-MASTED SAILING SHIP

in Europe to be neglected in favour of rapid production, but in the U.S.A. a wise alteration in the rules for measuring tonnage led to much faster and safer sailing ships. Steamboats made rapid progress. In 1802 Symington's Charlotte Dundas would have been a successful canal tug had vested interests not prevented her from running; in the U.S.A. Fulton produced the Clermont in 1807 and followed her with other river steamers of rapidly improving design. Bell's Comet, launched on the Clyde in 1812, was the first of a big fleet of passenger ships on British rivers.

First Sea-going Steamers

After Waterloo improvement in the hulls and rigging of all types of men-of-war was brought about after the Admiralty had been persuaded to abandon the "establishments" which rigidly linked displacement with gun power. Navies adopted steamers first as tugs and tenders but, in spite of the disadvantage of the paddle wheel for combatant work, soon built steam sloops and frigates carrying the heaviest guns. On the mercantile side the coastal steamer began to make short sea voyages in the 1820s, and by the 1840s had developed sufficiently to make ocean voyages to every sea, although on many routes it was not yet economical to use steamships with their very extravagant paddle engines and low pressure boilers. In spite of auxiliary sail the paddle liner could carry only a small cargo compared with her bunkers, and was used almost exclusively for passengers and mails. The development of the screw propeller, although it was not really efficient for many years, made a big difference, and by the middle of the 19th century iron-hulled, screw-propelled steamers were beginning to appear all over the world.

At the same time the design of sailing ships was rapidly reaching its peak. The clipper ship, which had been slowly developing in the U.S.A., suddenly got its opportunity with the discovery of gold in California in 1849, followed by the Australian gold rush in the early 1850s. Big ships were built to carry the gold-seekers, fine in line and with a tremendous spread of canvas; they made wonderful passages, but the strain on their fabric and the water-soaking of their softwood hulls gave most of them very short lives. The end of the Navigation Acts gave these American clippers the opportunity of entering the British tea trade

from China, but new British tonnage rules and hardwood hulls soon permitted British builders to produce better ships for the purpose, and American competition disappeared in a few years. For added strength composite construction was adopted: an iron framework with hardwood planking, which later developed into iron and steel hulls, each giving greater strength with less weight. The temptation to sacrifice strength for lightness, and to carry experiment to dangerous lengths, was checked by the operations of Lloyd's Register and other later registration societies and by govt. action.

Contemporaneously with these improvements in sailing ships the steamer was made more efficient and economical, the hull form being improved to reduce the resistance to the water that absorbed h.p., so that increased competition soon forced the sailing ship owners to build with full lines to carry the biggest possible cargo, and to redesign their rig to be run with smaller crews.

The Great Eastern

In spite of improvements, the sailing ships were fighting a losing battle, and the architects and engineers centred their interest on improving steamers. The famous Great Eastern (18,915 gross tons) showed that iron construction permitted a ship of virtually any size, although in practice the increase had to await increased trade. The Great Eastern was hopelessly unprofitable, although most of her features later proved practical. The fast blockade-runners built for the American Civil War were also uneconomical for ordinary trading, but their features frequently proved permanent.

There was steady improvement in normal designs. Experiments with models in tanks greatly improved hull lines, with such excellent results that these experiments came to be carried out even for the smallest vessels. Passenger liners were made much more economical by the improvement in the engines—first with compound, then with triple expansion, and then with a few quadruple expansion engines coupled with higher-pressure boilers. Cargo liner design developed rapidly after the opening of the Suez Canal and the speed steadily increased; while slow tramp steamers, which had been introduced in the late 1870s, captured more and more of the sailing ship's trade.

Naval design improved at the same time, first by the introduction of iron hulls and then by improvement in guns and armour.

Competition between the various navies had a big influence on mercantile design; when it was appreciated that the fastest liners on the Atlantic services could serve in emergency as auxiliary cruisers, all the naval powers gave subsidies which permitted ships of new standards to be built, and in the late 1880s twin-screw ships were built for the European-U.S.A. route with a gross tonnage of 10,000 and a speed of 20 knots. Very soon trans-Atlantic ships exceeded 20,000 tons and the speed had gone up to 23 knots; while the turbine engine, first tried in river and cross-Channel steamers, was extended to trans-Atlantic liners of moderate standards. The Cunard ships *Lusitania* and *Mauretania* were built in 1907 with govt. subsidy; they had a gross tonnage of 32,000 and turbine engines with a nominal speed of 25 knots but capable of much more. Some companies, however, decided that ships of large size and extreme comfort, with moderate speed, paid better than the record-breakers. The long-distance liners were naturally more conservative in their design and slower in their development. All types benefited by the discovery of the virtues of the cruiser stern instead of the overhanging counter, although it was not generally adopted until after 1918.

The Diesel internal combustion engine was introduced for ocean-going cargo ships by Danish and British builders in 1912, and proved to possess many advantages for certain types and trades. As an alternative, oil fuel was substituted for coal under the boilers of certain steamers, greatly reducing the bunker space required and the size of crew necessary and giving far better results.

Between the Wars

During the First Great War the British and American govts. built a very large number of tramp-type ships which flooded the market when they were put on the sale list after the armistice. Technical improvement was thus limited for some years. But the desire for luxury and speed in passenger liners had not died, and the German *Bremen* and *Europa* (c. 52,000 tons), the Italian *Rex* and *Conte di Savoia* (48,000 to 51,000 tons), the French *Normandie* (33,423 tons), and the Cunard *White Star Queen Mary* (81,235

SHIP : GREAT WESTERN* AND QUEEN ELIZABETH COMPARED

	<i>Great Western</i>	<i>Queen Elizabeth</i>
Length overall	236 ft.	1,031 ft.
Beam	35 ft. 4 ins.	118 ft.
Draught	10 ft.	36 ft.
Displacement	1,340 tons	85,000 tons
Engine h.p.	450	158,000
Propulsion	2 paddles	4 propellers
Designed speed	8 knots	29 knots
No. of decks	4	14
Height from bridge to keel ..	25 ft.	120 ft.
Passenger accommodation ..	300	2,315
Crew	60	1,100
Time of passage : London to New York	12 days	3 days, 5 hours, 50 mins.

*The Great Western, completed Jan., 1838, inaugurated the first regular steamship service across the Atlantic.

tons) followed one another in rapid succession, each in its turn breaking the Atlantic record. The Queen Elizabeth (83,673 net tons), completed during the Second Great War, was used as a troopship before making her maiden voyage as a passenger liner in Oct., 1946. Cargo liners and tankers to carry oil in bulk were also greatly improved in design. The competition of Diesel propulsion brought about great improvements in steam engineering, while electric drive, with current generated by turbines or Diesel engines, gave excellent results. It was not until some years after the end of the First Great War that the improved hull lines of tramps greatly reduced their fuel bills.

After the Second Great War there was again in the market an excess of tramp-type ships built by the British and U.S. govts., although fast tonnage suitable for regular services had also been built. Numerous wartime practices were found safe and continued in peace, while full advantage was taken of scientific experiments made officially. The great improvement of aluminium alloys in their resistance to corrosion at sea led to their adoption for many parts of the ship, and the use of plastics became general. In some directions design was greatly simplified, in others it was considerably complicated.

SHIPBUILDING. Most steel ships, and very few are built in the 20th century of anything else save in wartime, are laid down on an inclined slipway on shore whose lower end reaches sufficiently far into the water for the ship to be floated off when she is launched. A few large vessels are built in a dry dock with level floor to avoid the risk of accidents in launching; some of exceptional size have even been built half in one dock and half in another, the two ends being joined later.

The proposed lines of the ship having been tested in an experimental tank, detailed working plans are produced and enlarged to actual size with chalk on the floor of the mould loft, where they are corrected and faired as necessary. Patterns are made for every part of the ship and are reproduced in steel; some of them are obtained to shape from the steelworks and only completed in the yard, while others are shaped in the yard. Careful checking to ensure accuracy at every point is necessary.

The keel, which no longer projects below the hull as it did in sailing ships and which, with the keelsons, makes the backbone of the ship, is laid on the carefully levelled blocks of the slipway and the

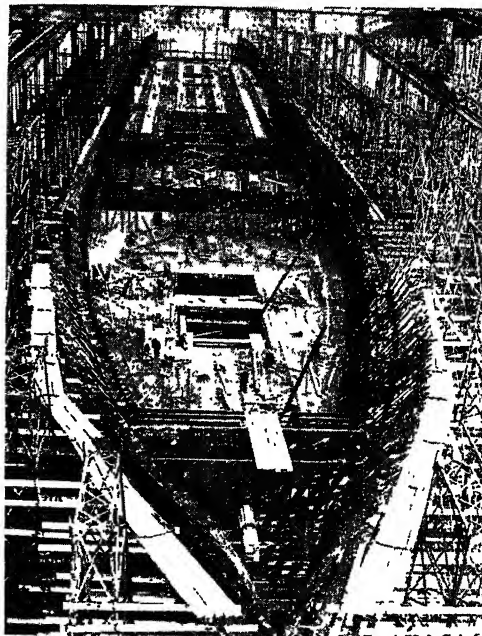
floors or floor plates are attached to it and adjacent plating by either riveting or welding (*q.v.*). The floors are the counterpart of the joists in a house ashore; under them is the bottom plating of the ship and laid on them, in virtually all ships of any size, are the tank tops. The double bottom of the ship is thus a very strongly-built raft, the space under the tank tops being used for water ballast, fresh water, or oil fuel. A complicated system of valves and pipes to the pumps allows the different compartments to be filled and emptied as required. It is made

watertight and of considerable strength so that if the ship strands, and the outer plating is pierced, the water is unlikely to get into the holds. In a few ships the double bottom is carried some distance up the side to give greater protection in case of collision.

The big stem (bow) and stern posts are erected at the ends of the keel. The floors are continued vertically after the turn of the bilge as frames, with horizontal stringers between them; but some ships, *e.g.* tankers, which are likely to be subjected to unusual longitudinal strains, are built with the horizontal frames more numerous and of greater strength than the uprights. That system was tried in the famous Great Eastern and revived by Sir Joseph Isherwood; later the two systems were generally combined.

Horizontal beams are stretched across the ship at intervals between the frames to support the various decks and 'tween decks, appropriately strengthened where they are cut through for hatchways into the holds.

When the frames are in place and held firmly by the beams, the plating or skin of the ship is continued up her sides from the tank tops. The long steel plates, which have to pass a careful examination by the surveyors of the classifica-



Shipbuilding. The Cape Town Castle, 25,000-ton motor ship of the Union-Castle Line, on the stocks at Harland and Wolff's yards at Belfast

tion societies or ministry like all the other material in the ship, are, in the case of a riveted ship, carefully marked and accurately punched so that the rivet holes coincide exactly with those in the frames and plates to which they are to be attached. The plates are placed in relation to one another on different systems in different ships, but care is taken to avoid too long a continuous line of rivet holes, particularly vertically, as that would seriously weaken the structure.

As the ship's sides rise, the bulkheads—transverse walls, which divide her into watertight com-

partments—are put in place. Their placing is governed by regulations and their construction is very carefully surveyed. In some ships, and in certain positions, watertight doors may be inserted in the bulkheads, but every precaution has to be taken.

The main or strength deck is built to heavier scantlings to give the whole ship girder strength in conjunction with the keel and double bottom. The side plating and frames above the strength deck may be of lighter material in certain types of ship, but if so the authorities insist on greater freeboard in placing the Plimsoll line than they would in the case of a ship with the same scantlings to her weather deck.

The superstructure is not called upon to withstand nearly as great a strain as the hull proper, so that in many ships it is constructed of an aluminium alloy, designed to resist the corrosion of sea water, instead of steel, in order to save weight, an important consideration both for the cost of propulsion and for stability.

Complete prefabrication of ships is practical only in wartime, when large numbers are built to precisely

the same design, but fabrication of parts is a feature of every 20th century shipyard. Big sections—deckhouses, bulkheads, and the like—are constructed in the shops instead of on the slipway, to which they are transported to be fixed in position. This permits work to be done in all weathers, and makes unnecessary overhead riveting or welding, which is a very severe strain on the shipwrights.

Welding is extensively used in the making of every new ship; but riveting, more usual in British yards, has several advantages in those parts of the ship which are subject to great strain. If riveted she is more elastic and will bend to the small extent that may prevent her from breaking, and bad workmanship is much more easily detected in the yard before she is put to the final test of heavy weather at sea. Hydraulic machines and pneumatic hammers are used wherever possible, but in some awkward corners hand-riveting may be necessary.

When the hull is sufficiently complete to float and to have stability, preparations are made to launch it. Increased weight means increased risk of accident at the launch, so that it normally takes the water as soon as possible, although on the Continent and in the U.S.A. a number of big ships have been launched with everything on board, and sometimes actually with steam up ready to sail away.

As the ship approaches the launching stage sliding ways are placed on the two parallel standing ways; the surfaces of the latter are freely lubricated with tallow, wax, or oil so that the sliding ways will travel down them without a hitch. By means of wedges driven by a large number of men working in perfect time the weight of the ship is lifted from the blocks on which she has been built and transferred to the sliding ways with massive timber cradles to support the ends. Just before the launch everything holding her in place is removed to the limit of safety and she is held only by the launching triggers, which are tripped when the traditional bottle of cham-

pagne is broken over her bow and she receives her name. If all goes well she immediately starts down the ways by her own weight; but powerful hydraulic rammers are invariably fitted under her bow to start her off if there is any sign of her sticking. If she does that in approximately the same position in which she was built no great harm is done, but if, generally owing to freezing of the tallow or other lubricant, she sticks when half the length of the ship is waterborne and the other half on dry land, there is a big chance of her breaking in two. Various means, carefully calculated beforehand, are taken to prevent her from "taking charge" when she is waterborne: most shipyards are on comparatively narrow rivers, and some newly launched ships have been wrecked on the opposite bank.

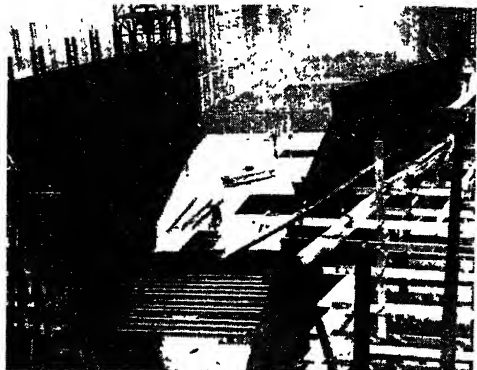
Except when launched broadside on, a ship is always launched stern foremost because the after lines, particularly above the waterline, are so much fuller than the bow lines that they give her buoyancy the moment the water reaches a certain height up her side; if she were launched with her finelined bow foremost there would be the danger of her diving and the water finding its way below.

Immediately the hull is launched tugs take charge and tow it to the fitting-out berth. There the engines and boilers are installed, the accommodation for passengers and crew is fitted, and she is completed and painted. The time taken on fitting is often as long as that during which the ship was being constructed on the stocks.

In the last stages she runs basin trials while made fast to the dock wall to make sure that her machinery is running smoothly. Any faults which show themselves are then rectified and she is taken out on her sea trials to prove to the owners that the builders have satisfied their guarantee as to her speed at a given draught, her fuel consumption, steering, and other points which vary according to the contract made.

Ship Canal. Artificial waterway for the passage of sea-going vessels. A ship canal may constitute a connecting link between two seas or oceans, or may merely provide a means of access from the sea to an inland town or district, or a navigable river or lake. Ship canals may be most conveniently classified as those with locks and those without locks.

The essential conditions for a ship canal without locks are that



Shipbuilding. The second *Mauretania* at Cammell Laird's yard, Birkenhead, showing the skeleton hull

water level at both ends should be approximately the same; that circumstances permit of an approx-



Shipka Pass, Bulgaria. Winding road over the pass which traverses the Balkan Mountains from north to south

imately level channel being constructed from end to end of the canal; and that any slight differences in level resulting in a gradient or fall must be capable of being made good by a reliable and adequate supply of water at the highest levels reached. The Suez Canal, between the Mediterranean and Red seas, is an early example of a ship canal without locks.

When the construction of a canal at the same level throughout its length is impossible, or is rendered prohibitive by reason of the cost, locks are introduced, by means of which it may rise in the interior far above sea level. In such cases, it is essential that an ample and constant supply of water should be available to make good the wastage at the locks. The most notable example of this type is the Panama Canal.

The Kiel Canal connects the Baltic and North seas. Other ship canals are the Midland Canal, an E.-W. link in Germany's waterways; the Corinth Canal, connecting the Adriatic and Aegean seas, length four miles; the Manchester Ship Canal, length 35½ m.; and the Kronstadt to Leningrad canal, length 17½ m. In America are the two short but important ship canals at Sault Ste. Marie, connecting Lakes Superior and Huron; one is in the United States, and the other in Canada. In Canada also is the Welland Canal, uniting Lakes Ontario and Erie. See Canal; Kiel Canal; Manchester Ship Canal; Panama Canal; Sault Ste. Marie Canals; Suez Canal; Welland Canal.

Shipka Pass (Wild Rose pass). Noted pass in the Balkan Mts., Bulgaria. It leads from Plevna by the Yantra valley to the upper Tunja valley and to Plovdiv, 52 m. to the S.S.W. The summit is

4,370 ft. alt. The majority of the distilleries of attar of roses are at Karlovo and Kazanlik, at the S. end of the pass. In July, 1877, the Turks occupied the pass, but were soon compelled by the Russians to evacuate it. See Russo-Turkish Wars.

Shipley. Urban dist. of the W. Riding of Yorkshire, on the R. Aire. At the junction of the Leeds-Bradford and Leeds-Cardiff rlys., it is also

served by the Leeds-Liverpool canal. The main industries are textiles and engineering. Open spaces include the Northcliff woods and playing fields (115 acres). Saltaire (*q.v.*) is within the district. Shipley gives its name to a co. constituency. Shipley glen, a beauty spot and gateway to the Ilkley moors, is N. of the river. Pop. 32,000.

Another Shipley, near Horsham, Sussex, was long the residence of Hilaire Belloc, who restored the old mill.

Shipley, Sir ARTHUR EVERETT (1861-1927). British zoologist. Born Mar. 10, 1861, he graduated at

Cambridge in 1882, and three years later was appointed demonstrator of comparative anatomy. In 1894 he became lecturer on the advanced morphology of the invertebrata. In 1887 he had been elected a fellow of Christ's College of which he became master in 1910. Shipley was vice-chancellor of the university, 1917-19. He wrote on zoology and kindred sciences, and was joint editor and part author of the Cambridge Natural History, 1905-09. He was created G.B.E. in 1920, and died Sept. 22, 1927.

Ship Money. Tax levied by Charles I in 1634, and memorable owing to the resistance of John Hampden. In previous reigns it had been usual for seaport towns to fit out ships to defend the coasts, but only in time of war. Acting on the advice of Noy, the attorney-general, Charles, in 1634, demanded ship-money from the seaport towns, ostensibly on the ground

that more ships were wanted to deal with the coastal pirates.

In 1635 the writs were repeated, but this time they were also sent to inland towns, which had never previously paid the tax. Many, however, paid, and a third time the tax was levied, the judges having declared that, as the kingdom was in danger, the impost was legal. Hampden, however, refused to pay, although the amount due by him was small, and the case came before the court of exchequer in 1637. Of twelve judges, seven decided that Charles was justified in levying the tax.

Shipping. The industry of conveying passengers and cargo in ships. No record exists of the transitional stage from the dug-out log and reed raft to the seagoing ship. The adventures and contrivances of mankind during this evolutionary era remain a closed book. Historical record begins with the period when seagoing vessels, equipped with oars, sails and steering-gear of a primitive kind, were extending trade in an early civilization.

The Phoenicians who settled along the Syrian coast developed overseas trade to an extent that their prosperity came to depend largely on shipping—the first of the human race to become thus dependent. Notable also among the seafarers of the ancient world were the Chinese, Malays, Arabs, and Egyptians. Voyages were being made between Arabia and India at least 3,000 years B.C.

During the classical era and that of the Roman Empire, voyages were made to Britain and the W. coast of Africa. Sea trade developed in the early centuries A.D., when, not uncommonly, both ship and cargo were owned by the same trader. It was customary, too, for a group of traders to charter a vessel, or, alternatively, to arrange with the ship owner for cargo space.

Probably the largest ships were not more than 300 tons—slow, cumbersome craft owing to their broad beam, deep draught when laden, and clumsy rig. Most voyages were undertaken in summer, and seafarers of Roman times navigated mainly by keeping within sight of land.

For many centuries the Mediterranean was the hub of shipping activity. Seaborne trade increased considerably, but the slow-moving vessels conveying trade goods invited the attention of piratical craft of more rakish design. Protection to shipping was given accordingly by the Roman



Sir Arthur Shipley,
British zoologist
Russell

fleets, consisting of oar-propelled galleys which were easily manoeuvrable and comparatively fast. These primitive warships almost succeeded in eliminating the menace of Mediterranean pirates. Meanwhile shipping became an organized industry. Laws in connexion with maritime affairs in that early epoch provided the foundation for all the intricate legislation relating to the vast modern shipping industry.

Seaborne trade expanded, and Venice and Genoa gained renown in maritime affairs. The English, whose seamanship was developed largely in coastal fisheries, enjoyed little prestige until the dawn of the 16th century.

Marine insurance, expanded systematically by the Italians, helped to stabilise shipping as an industry. The wide extension of trade during the Middle Ages was due in part to improved methods of navigation. Further progress was due to the enterprise of daring navigators, e.g. Magellan, Columbus, Vasco da Gama, and John Cabot, whose voyages of discovery over uncharted oceans opened new lands for colonisation. In the intense activity of this period Spain secured the position of first maritime power and held it until the defeat of the Armada. England became the great naval power in Elizabeth's reign, but the Dutch were dominant in commercial shipping. In 1600 England had roughly 200 ships of commerce of 100 tons and over, most of the larger types being owned by the various chartered companies.

The Dutch trade gradually declined during the latter half of the 18th century. On the other hand, English shipping received a strong impetus in this period when colonisation was creating new overseas markets. Exact figures are not available, but there is reason to believe that by 1770 the clearances of vessels from English ports amounted to about 700,000 tons, and that 200 of these ships were engaged in the slave trade.

Registration of shipping became compulsory in 1786, and about fifty years later (1837) Lloyd's Register classed an iron-built ship for the first time. Meanwhile American enterprise produced fast clippers and packets which plied in the Atlantic, won renown in the China tea trade, and proved a national boon by conveying migrants and stores during the years of the California gold rush in the middle 19th century. Stimulated by this healthy competition, Great

Britain proceeded to construct clippers of such beauty and speed that their epoch is immortalised as the "golden age of sail." Before the advent of 1900, however, the transition from wood to iron and from iron to steel in shipbuilding, and from sail to steam in ship propulsion, brought about far-reaching changes in all seaborne trade.

National fleets expanded in numbers, and ship units in size, power, and speed. Whereas the 19th century clippers were of 1,500 to 2,000 tons, contemporary liners range from 5,000 to 80,000 tons. Two nations, the Germans and the Japanese, achieved prominence in the shipping industry, but were eliminated from world competition for a period after defeat in the Second Great War.

The forms of ownership and organization in the industry have changed greatly with the centuries, through the evolution of the ship and conditions in general. The era of the chartered companies gave place in the 18th century to ownership by individuals or partners. In the 19th century many ships were owned on a system whereby numbers of people shared proportionately to the amount of the purchase money subscribed by each. Then, as ships became larger and costlier, this system was superseded by the joint stock company.

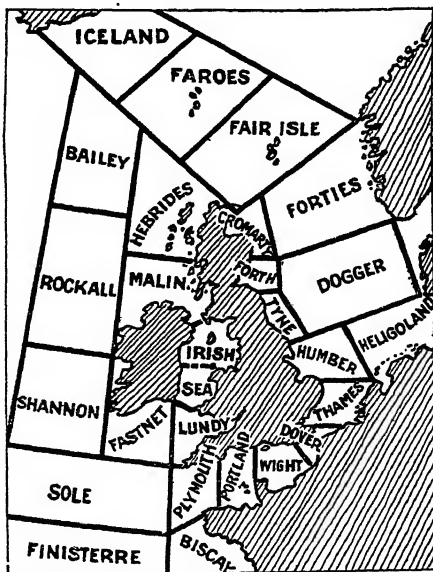
Two factors have had a powerful effect on shipping. One is the use of oil and oil products, for fuel and a thousand-and-one other purposes. Nowadays the specially constructed oil tanker is a common sight everywhere at sea. The other factor is the impact on the industry of two world wars involving the chief maritime powers and causing immense destruction of shipping. Inevitably, after the Second Great War, the U.S.A., which had suffered far less physically and economically than Great Britain (for long supreme on the seas), emerged as the principal naval power and also as the possessor of the largest mercantile fleet.

The gross tonnage of shipping owned in 1947-48 by Great Britain and Northern

Ireland (excluding vessels of less than 100 tons) was: steamships, 12,623,273; motorships, 5,224,624; sailing vessels and barges, 100,942; total 17,948,839 gross tons. Other maritime countries owned, in gross tons: U.S.A. (seagoing ships and Great Lakes vessels), 32,890,745; British Empire, 21,549,225; Norway, 3,761,771; Netherlands, 2,441,359; France, 2,326,864; U.S.S.R., 2,164,467; Sweden, 1,829,992; Panama, 1,706,858; Italy, 1,317,155; Spain, 1,140,035; Greece, 1,027,101; Germany, 598,252. No exact figure was available for tonnage owned by Japan in 1947-48, but it is known that that country lost more than 4,000,000 tons gross of shipping in the Second Great War. See Lloyd's Merchant Navy; Navigation Acts; Ship. Consult Appendix to Lloyd's Register Book (annually).

W. E. Stanton-Hope

Shipping Forecast. Special forecast made by the meteorological office of the Air Ministry at Dunstable of weather conditions prevailing over the coastal areas around the British Isles during the ensuing 24 hrs. Such forecasts are broadcast four times daily by the B.B.C. For convenience the survey is divided into forecasts for four areas, N., E., W., and S., and further sub-divided into districts, e.g. districts Shannon, Dogger, Forties, Wight (see the accompanying map). A gale warning may be broadcast with a shipping forecast, but is not strictly a part of it.



Shipping Forecast. Sea areas off the British Isles referred to in the daily shipping forecasts from 1948

Ship's Company. Synonym for a ship's crew. It does not include the officers. The correct way of describing the complement of a ship is officers and crew, or ship's company and officers.

Shipton, MOTHER. Legendary English soothsayer. The earliest known reference to her is in an anonymous pamphlet published in London in 1641: *The Prophecies of Mother Shipton in the Raigne of King Henry 8th*, foretelling the death of Cardinal Wolsey, the Lord Percy, and others, as also what should happen in ensuing Times. Lilly, the astrologer, quoted 18 of her predictions in his *Collection of Prophecies*, 1645, de-



Mother Shipton, the legendary English prophetess. From a drawing by Sir W. Ouseley

claring that 16 of them had been fulfilled. In the reign of Charles II, Richard Head wrote her *Life and Death*, representing her as a daughter of the devil. An anonymous pamphlet of 1686 states that she was born at Knaresborough in 1488, and died in 1561, her maiden name being Ursula Southill. Her existence is, however, very doubtful. Prophecies attributed to her, notably those forged by Charles Hindley, 1862, were widely accepted by the ignorant, and caused widespread alarm in rural districts in 1881, when people gathered to pray in the fields, anticipating the end of the world. Consult *Mother Shipton Investigated*, W. H. Harrison, 1881.

Shipworm. Popular name for the mollusc *Teredo* (q.v.).

Shiraz. Walled city of Persia. Situated in a fertile valley, it is the capital of the prov. of Fars, 125 m. E.N.E. of Bushire, and has long been an important centre of trade. It does much business in wine, cottons, gums, opium, carpets, and otto of roses, and lies on the caravan road from Bushire, on the Persian Gulf, to Ispahan, which lies 220 m. almost due N. It has

cable connexion with Bushire, and a radio station. It is famous as the birthplace of the poets Hafiz and Sa'di. Its inhabitants are credited with speaking the purest Persian in the country. Founded in 697, it was formerly one of the chief places of the Zoroastrians, and 2 m. away are the ruins of the Zoroastrian temple of Mossella. Of the numerous pleasant gardens (bagh), one of the oldest is the Bagh-i-Takht-i-Kajar. In 1812, 1824, and 1853 disastrous earthquakes caused much damage to the city.

Before the outbreak of the First Great War British troops occupied Shiraz on account of the disturbed state of S.W. Persia, but after some months were withdrawn. During the war disbanded gendarmes broke into revolt in the city in 1915, and imprisoned the British consul, with other British subjects, for several months. Order was restored by Sir Percy Sykes. Pop. 129,000. See Persia.

Shire (A.S. *sciran*, to divide; cf. share and shear). In England, term applied from about the 8th century onwards to the districts into which the country was divided. To some extent these districts corresponded to the kingdoms which became united under one overlord. They were ruled, not by petty kings, as at first, but by earls or aldermen, whose authority



Shiraz, Persia. Bagh-i-Takht-i-Kajar, the splendid throne garden and palace to the north of the city

other questions discussed was that of the shire boundaries, which were occasionally rather indefinite in consequence of the activities of the border thanes.

Some of the shires, e.g. Hallamshire, became absorbed. In the Midlands the shire is the same as the modern county, but several counties, e.g. Durham, Norfolk, Surrey, Cornwall, were never called shires. All the Welsh counties except Anglesey are shires, and in Scotland nearly all the county names end in -shire. In N. Ireland and Eire, on the other hand, county is the usual prefix, e.g. co. Down, co. Kerry. See County.

Shire. River of the Nyasaland protectorate and Mozambique. It is 295 m. long and forms the S. outlet of Lake Nyasa, passing through the reedy swamp of Lake Malombe. Navigation is obstructed by cataracts for 35 m., at the Murchison Falls, 80 m. below the lake, and although at one time possible as far as Chiromo is now

extremely difficult, owing to the fall in the level of the river. The only important tributary is the Ruu. The chief settlements are Fort Johnston, Liwonde, Chiromo, Port Herald, and Chindio.

Shire Horse. Largest and heaviest breed of horse, believed to be descended directly from the old English "great horse" or war horse. It is large limbed, with full, flowing mane and tail, and the fet-



Shire Horse. Champion specimen of the heavy breed of horse, descended from the old English war horse

Gambier Bolton, F.Z.S.

locks are clothed with long, silky hair. The maintenance and improvement of the breed is looked after by the Shire Horse Society. See Horse colour plate.

Shirley. Novel by Charlotte Brontë, first published under the pseudonym of Currer Bell, in 1849. It is a story of Yorkshire life, full of characters more or less closely drawn from people whom the author knew, and containing episodes based on events brought within her personal knowledge.

Shirley, JAMES (1596-1666). English dramatic poet. Born in London, Sept. 18, 1596, he was



James Shirley,
English dramatist.
After J. Thurston

educated at Merchant Taylors' School, St. John's College, Oxford, and Catharine Hall, Cambridge, afterwards being by turns clergyman, schoolmaster, playwright, soldier in the Royalist cause, and again schoolmaster. He and his wife died in Oct., 1666, on the same day, of shock and distress at their losses caused by the Great Fire. Of Shirley's plays the best are the comedy *The Lady of Pleasure* and the tragedy *The Traitor*. He wrote some exquisite lyrics, notably "The glories of our blood and state," and excellent dialogue, and dramatised Sidney's *Arcadia*. There are editions of his plays by Gifford and Dyce (1833) and E. Gosse (1888). *Consult* Life, A. H. Nason, 1915.

Shirreff, JOHN (1759-1818). British agriculturist. After travelling abroad he settled down to farming in Haddingtonshire, and, in 1793, was one of a committee of three appointed to make an agricultural survey of the W. Riding of Yorkshire. He then experimented with various methods for improving agricultural implements and the methods of tilling, and contributed articles to farmers' and other magazines. In 1804 he surveyed the Orkney and Shetland Islands. Shirreff died Nov. 2, 1818.

Shirt (Dan. *skiorte*, shortened garment). Under-garment of linen, cotton, or flannel, for men. In Saxon times shirts were worn by both sexes, and at various periods have been embroidered, especially during the Tudor period, when the needlework on them was very elaborate. Skirt, strictly the lower part of the shirt, is used as the name for the part of a woman's dress which covers the body from the waist downwards. (*See* Costume.)

Of materials used for shirts the bleached cotton shirtings of the British home trade are calicoes, but

there are also coloured and fancy woven shirtings. Oxford shirting is woven with the warp threads lifted in pairs, and usually with coloured warp stripes. Harvard shirting has a harder feel than Oxford. Grandrelle shirting is made with particularly coloured twisted yarn. Fancy shirtings, with woven or printed stripes or figures, are made in great variety from cotton. Poplin shirtings are of warp-ribbed cotton. Union and Ceylon shirtings contain more or less wool. Rayon is used for sports wear.

Shirwa or **CHILWA**. Lake of Central Africa. It lies on the border between Nyasaland and Portuguese East Africa, 60 m. S.E. of Lake Nyasa. Situated amid mountains, it is shrinking in size through excessive evaporation, and is now a swamp 40 m. long and 18 m. wide, haunted by waterfowl. It was discovered by Livingstone in 1859.

Shishak. Name of four Egyptian kings of the XXIIInd dynasty. The Biblical spelling represents the Egyptian Sheshenq or Sheshonk. Shishak I (c. 945-924 B.C.) invaded Palestine and despoiled Solomon's temple and palace at Jerusalem under Rehoboam (1 Kings 14). On a Karnak temple-wall 156 Asiatic figures symbolise places in Palestine which, it is claimed, he captured.

Shittim Wood. Wood of an acacia tree (*A. seyal*), which is found in the valleys around and S. of the Dead Sea, Palestine. Hard and close-grained, the wood was largely used in the construction of the Tabernacle.

Shizuoka. Town of Honshu, Japan. The capital of Shizuoka prefecture, it stands on Suruga bay, 95 m. S.W. of Tokyo, with which it is connected by rly. It was the seat of the last of the Tokugawa Shoguns, Prince Yoshinobu, whose castle still stands. Tea, lacquer, and bamboo wares are produced. Pop. 181,212.

Shkara Mt. Peak in the Caucasus Mts. It lies S.E. of Elburz, and rises to 17,000 ft.

Shkoder or **SCUTARI**. Town of Albania. Situated on the Bojana, S.E. of Lake Shkoder, it lies some 12 m. from the Adriatic. It has a small woollen industry and exports hides, salt, and tobacco. It is the capital of the prefecture of the same name. In the first Balkan War the town was besieged by the Montenegrins and afterwards by the Serbians, but it held out until April, 1913. During the First Great War it was occupied at first by Montenegro, but after Serbia and Montenegro were overrun in

1915-16, it was seized by the Austrians, who held it until the autumn of 1918. In the Second Great War it was occupied by Italian troops. Lake Shkoder (or Scutari), partly in Albania and partly in Yugoslavia, is 27 m. long, with a maximum width of 10 m.

Shkumbi or **SCUMBI**. River of Albania. It rises in the Eastern Mts. and flows almost due W. past Elbasan to the Adriatic Sea. The old route to Constantinople, the Via Egnatia, and the modern rly. follow the valley up to Elbasan.

Shoa. Central dist. of Abyssinia, at one time an independent kingdom. It is in the south-central portion of the country, and is a mountainous dist. chiefly inhabited by Abyssinians and Gallas. The chief town is Addis Ababa. In 1889 Menelek II, the king of Shoa, became king of Abyssinia (*q.v.*).

Shoal (akin to *shallow*). Place where the water of a river, lake, or sea shallows. Shoals occur over sandbanks, bars, or reefs, and are to be distinguished from submarine banks such as the Dogger, in that they rise sufficiently close to the watersurface to interfere with navigation. Shoals run for hundreds of miles along the West African coast, between Lagos and Freetown, necessitating the transfer of everything to small surf boats.

Shock. Medical term, used to describe the condition which follows prolonged anxiety. It also applies to the more severe condition of surgical shock, which is caused by a decrease in strength of the blood-vessel walls, allowing the blood-fluid to escape into the tissues. It follows severe injuries.

Simple shock is treated by lowering the head, rest, warmth, and mental reassurance, together with any simple remedy which is available. Surgical shock demands replacement of the circulating fluids by blood transfusion or saline injections, together with oxygen inhalation and the use of drugs, such as adrenalin, which keep up the blood pressure.

Shock Troops. Soldiers specially trained to carry out mass assault action immediately after a heavy bombardment, particularly against strongly defended positions. They were used extensively by the Russian and German armies on the eastern front in the Second Great War. In the British army the functions of shock troops were carried out by commando (*q.v.*) units.

Shock Wave. A short, sharp pressure wave, such as the wave which carries outwards the first

force of an explosion (*q.v.*). The pressure in the first crest of the wave will usually be high (up to many atmospheres); a correspondingly great rarefaction in the trough following is impossible, since the pressure cannot drop below zero. Hence the wave form is distorted: the front is steep, the crest of high pressure is of extremely short duration, the following rarefaction is spread out over a much longer period. In some respects such a wave is analogous to a surface wave in shallow water. Shock waves are also produced by shells, rockets, aeroplanes, etc., travelling faster than sound. Here the high-pressure front is built up by the nose or leading-edge continually overtaking the sound waves which would otherwise dissipate the energy forward. This is analogous to the waves at the bows of a ship.



Shoe-bill. Head, showing the broad, heavy beak
W. S. Berridge, F.Z.S.

Shoddy (A.S. *scéadan*, to shed). Word loosely used to denote any twice-used wool. Shoddy is the long fibre obtained from shredding stockings, worsted, carpets, and the like. The qualities vary with the source of origin. Large quantities of clippings of cloth from tailors' shops and factories are converted into shoddy, and the utilisation of similar waste has an antiquity of four or five hundred years. Shoddy-making has been a systematised factory industry since the beginning of the 19th century, and its centre in U.K. is Dewsbury. The materials are thoroughly cleansed before unpicking, all cotton threads removed, and sorted into various colours and qualities. They are then oiled to facilitate the separation of the threads, and "teased" into a fibrous mass, from which the material can be freshly spun. The fibres are usually short, and are mixed with new, long fibres before being made into yarn. *See* Rags.

Shoe (A.S. *scéa*). Covering for the foot. It is often distinguished from a boot in that it reaches only to the ankle, but in the U.S.A. all articles of footwear are called shoes. (*See* Boots and Shoes.) A shoeblack is the name given to one who cleans shoes. Through the efforts of J. Macgregor (*q.v.*), shoe-black brigades were started in London in 1851. They are associated with the Shaftesbury Society (*q.v.*).

The name shoe is also applied to various articles whose shape or use is similar to that of the shoe. The plate of metal nailed to the hoof of a horse to prevent wear is called a horseshoe. In building, a shoe is the short section at the bottom of a rain-water pipe that directs the issuing water. It is also the iron point of a pile; part of a brake (*q.v.*); and a piece of wood attached to an anchor to prevent it, when rising, from tearing the ship's side. *See* Farrier.

Shoe-bill OR **WHALE-HEAD** (*Balaeniceps rex*). Species of heron, found rather rarely in Equatorial Africa. It is distinguished by the enormous beak, which somewhat resembles a shoe or boat in shape. The bird is of large size, has very long legs and grey plumage, and is found among the reeds by the side of rivers. Its food consists of fish and carrion.

Shoeburyness. Locality on the estuary of the Thames, Essex, England; a suburb in the corner of Southend-on-Sea, in which it was incorporated in 1933. Served by rly., it has a fine beach and bathing facilities. There is a school of gunnery at Shoebury garrison. St. Andrew's, a Perpendicular edifice, is the parish church at St. Shoebury; a former vicar, Arthur Dent, wrote *The Plaine Man's Path-Way to Heaven*, 1601. Pop. est. 6,700. Shoebury Ness is a cape where the coast turns N.E. On the average it is about the driest spot in England. To their encampment here the Danes retreated after their defeat by Alfred at Benfleet in 894.

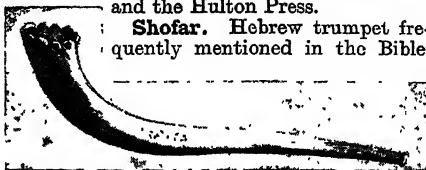
Shoe Lane. London thoroughfare linking Fleet Street with Charterhouse Street, E.C. Formerly it extended from Holborn to Bridewell. Residents have included the Black Friars, who settled here about 1230; Henry de Lacy, earl of Lincoln, who acquired their house; and John Florio, translator of Montaigne. In Gunpowder Alley the poet Lovelace died in poverty. Chatterton was buried in the graveyard later covered by Farringdon Avenue.

Quite near St. Andrew's church was Bangor House, built about 1378, destroyed 1828; and, nearly opposite, the palace of Oldbourne Hall, described as old by Stow in 1598, later covered by a brass foundry. At an inn known as The Windmill Felton conceived the murder of the duke of Bucking-

ham. Wotton and Pepys refer to a cockpit in Shoe Lane. Ben Jonson's Court and tavern stood near the S.E. corner.

During the Second Great War Shoe Lane was extensively damaged by bombing. On the E. side an area nearly 200 yds. long and extending in places as far as Farringdon St. was razed. At the N. end, from Charterhouse St. to Holborn Viaduct, all the buildings were destroyed, and St. Andrew's church and the City Temple (*q.v.*) were gutted. The glass-walled offices of the Daily Express adjoin Shoe Lane at the S. end, and in the street are the offices of the Evening Standard and the Hulton Press.

Shofar. Hebrew trumpet frequently mentioned in the Bible,



Shofar. Hebrew trumpet used on New Year's Day

and still used in the modern synagogue. It is the horn of a ram or any clean animal, and produces only the natural series of harmonics from its fundamental note, these being obtained by the increasing pressure of the air from the lips. In practice the notes sounded are the octave twelfth, and double octave only, more importance being attached to the rhythm than to the pitch of the notes. The following is a shofar call (Teruah shebarim):



Shogun (Jap., general). Originally, the title of a military commander. In 1192 the emperor conferred on Yoritomo Minamoto, the leader of one of the two great military families of the period, the title of sei-i-tai-shogun (barbarian-quelling great general). From that time the shoguns—who were always formally appointed by the emperor—became so powerful that they came to be regarded as the temporal rulers of Japan, and the mikados as the spiritual rulers. The shogunate was abolished in 1868. The shogun was also called tycoon, Chinese for "great lord."

Shola OR **SOLAH**. Pith of the plant *Aeschynomene aspera*, a native of India. The pith is extensively used, on account of its lightness, in hats and helmets.

Sholapur. Dist. and town of India, in the Central division, Bombay state. The dist. lies E. of

the W. Ghats and marches with Hyderabad on the E. It occupies a fertile portion of the Deccan, and has an annual rainfall of 26 ins. The town is a great road centre 147 m. S. E. of Poona, and is on the rly. from Bombay to Madras. It has considerable trade in locally grown cotton, and makes silk and cotton goods. It was one of the great centres of Mahratta authority, and its fort was captured in 1818 by Gen. Munro in the Mahratta Wars. Area, 4,572 sq. m. Pop., dist. 1,014,670; town, 212,620.

Shooting. Art of using firearms. Shooting is of two chief kinds, in war and in sport. The former, however, is more usually known as gunnery or marksmanship, leaving the word shooting in common speech to the latter. (See Artillery; Bisley; Gunnery; Revolver; Rifle, etc.)

In the British Isles the chief objects of this form of sport are pheasants, partridges, grouse, rabbits, snipe, etc. The shooting of stags is generally known as deer-stalking (*q.v.*). Another form, confined to very few parts of the world, is big game shooting.

In shooting as a sport, the sportsman should always break his gun and remove the charge or charges when walking from one part of the shoot to another, and when putting the gun away or otherwise letting it out of his hands; on the other hand, an axiom of good sportsmanship is that *a gun is always loaded*, i.e. should invariably be handled as though it were loaded. A gun should always be carried pointing to the ground, and should never in any circumstances be pointed at any person. Shooting accidents occur either because a man walking with a loaded gun has stumbled or slipped, thus losing control of his weapon, or because a gun has been handled carelessly or pointed jocularly, the handler believing it to be unloaded.

The correct position in which to stand when firing; the method of shooting at flying game so as to judge on the instant the exact spot where the charge and the quarry will come in contact; the manner of changing guns with the man who is loading, and all the intricacies of the science of shooting can be acquired only by actual practice and demonstrated instruction.

Grouse, partridge, and pheasant shooting, now that birds are usually driven towards the guns, require great skill on the part of the shooter, as the birds fly at a high rate of speed, especially when com-

ing down wind, and the correct timing of them entails good judgement of pace. See Big Game; Bisley; Clay Bird; Game Laws; Grouse; Gun Licence; Partridge; Pheasant; Pigeon Shooting; Snipe; Sporting Gun.

Shooting Star. Popular name given to the incandescent passage of meteors through the earth's atmosphere. See Meteor.

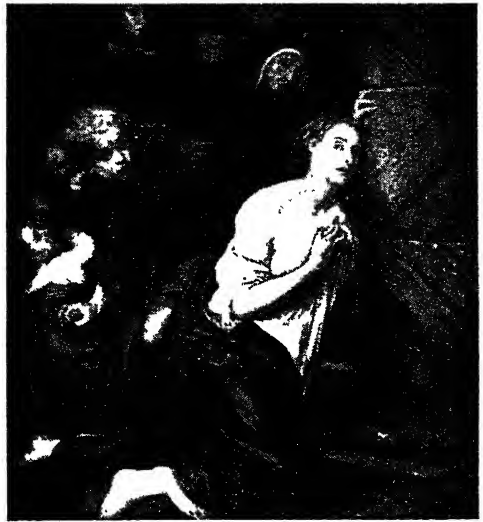
Shop (A.S. *scoppa*, stall or booth). Room or building in which goods are sold. Originally shops were selling points at fairs and markets, and much business is still done at market stalls. Shops may range in size from the front room or front window of a cottage to an elegantly fitted mansion, including within itself many shops. Such establishments are commonly called department stores. Companies may own numerous shops, all selling similar goods. Some manufacturers, e.g. of cooked food, boots and shoes, ready-made clothing or drugs, have their own multiple shop organization as the principal outlet for their goods.

Statistics of shops are defective, but according to figures issued by the ministry of Food, there were in the U.K. in 1946 598,000 retail outlets for the sale of food-stuffs; of these, 45,000 were butchers, 100,000 dairymen, 27,000 fishmongers, 22,000 fish friers, 147,000 grocers, provision merchants, and general food shops, 110,000 retailers of fresh fruit and vegetables, and 25,000 bakers. Chocolate and sugar confectionery were sold at 226,000 places.

Towards the end of the 19th century various Shops Acts were passed. These regulated hours and conditions of labour. The Shops Act of 1912 provided, among other things, (a) that no person under 18 may be employed for more than 74 hours, including mealtimes, in any one week; (b) that at least one seat must be available for every 3 female assistants; (c) that on at least one day in each week each shop assistant

shall not be employed after 1.30 p.m.; (d) that assistants shall not work continuously for more than six hours without at least 20 mins. interval, or between 11.30 and 2.30 without a break for a meal of 45 mins., or between 4 to 7 p.m. without 30 mins. for tea. Moreover, every shop (unless exempted) must close at 1 p.m. on one day in every week, the local authority having the power to decide the early closing day, and also to exempt certain shopkeepers. The hour of closing was regulated by the Shops Act of 1928. The Early Closing Association, of 1-3, St. Paul's Churchyard, London, E.C.4, encourages earlier closing of shops.

Shop Steward. Representative of trade union within the



Jane Shore imprisoned as a witch in the dungeons of Ludgate. From the painting by J. N. Robert-Fleury. See p. 7530.

Luxembourg, Paris

workshop, elected by his fellow-workers to act as the link between the factory and the branch of the union, to carry out union business within the factory, to express the views of his own group of members at branch meetings, to advise members in difficulties with their supervisors, and to interview the management on members' behalf. A shop steward is a full-time employee of the company for which he works, but most trade union agreements provide that shop stewards shall be permitted reasonable facilities to attend to trade union business. The chief shop steward of a large works may have his own office, and may be engaged almost full-time on union business, although paid by the company.

The shop steward movement originated during the First Great War. The Munitions of War Act, 1915, made strikes and lock outs illegal over the greater part of industry, and substituted compulsory arbitration for the settlement of disputes. This encouraged "unofficial action" on the spot, and the election of leaders within the works to negotiate with the management. During the Second Great War shop stewards were generally among those elected by the workpeople to the joint production committees set up in war factories; they were sometimes an important factor in the success of wartime production efforts.

Shore, JANE (d. c. 1527). Mistress of Edward IV of England. The daughter of Thomas Wainstead, a London mercer, she married a goldsmith named William Shore, but about 1470 became Edward IV's mistress, having attracted him by her liveliness and wit. She used her political influence well, but after Edward's death was charged by Richard III with sorcery, was made to do penance, imprisoned, and deprived of her wealth. She died in great poverty. Jane Shore was celebrated by the poets Churchyard and Drayton, by T. Heywood in his *Edward IV*, and is the subject of plays by N. Rowe, 1714, and W. G. Wills, 1876. See *illus.* p. 7529.

Shoreditch. Met. bor. of the co. of London. It lies N.E. of the City, with Finsbury W., Islington N.W.,



Shoreditch arms

Hackney and Bethnal Green E., and Stepney S.E., includes the dists. of Moorfields, Hoxton, Haggerston, and Kingsland, and has tram and bus connexion with Liverpool Street. It is named after the Soerdiches, lords of the manor in the time of Edward III.

Covering about one sq. m., it once possessed a Benedictine nunnery, of which Holywell Lane is a reminder, and on part of the site of which James Burbage built the first theatre in London, The Theatre, about 1576, a little later erecting The Curtain, commemorated by Curtain Road. The Theatre was taken down in 1599; parts of The Curtain existed down to 1772. In S. James's church was a window in memory of Shakespeare's connexion with the two theatres.

The parish church of S. Leonard, founded in the 13th century, was rebuilt about 1740, and restored in



Shoreditch. Parish church of S. Leonard, rebuilt about 1740

1890; it is known as the actors' church, Richard Tarleton and James and Richard Burbage being buried here. The church suffered considerable damage in the Second Great War. The churchyard is now a public garden. Near to the church is the Geffrye museum (*q.v.*). The fine town hall, 1866, extended 1901, was reconstructed 1905-06, after a fire in 1904. The winner at the archery contests held here was known as "duke of Shoreditch." Chatterton lived in Shoreditch in 1770. It shares an M.P. with Finsbury. Pop. 45,000.

Shoreham-by-Sea. Seaport and watering place of Sussex, England. It stands at the mouth of the Adur 6 m. from Brighton, and is an urban dist. consisting of New Shoreham, Old Shoreham, Shoreham Beach, and Kingston-Buci. It has a rly. station on the main Brighton-Portsmouth line. There are three fine old churches: S. Nicholas, Old Shoreham, Saxon and Norman; S. Mary, New Shoreham, Norman to Early English; S. Julian, Kingston-Buci, Early English. The Marlpins, an ancient building in the High St., dates from 1120 and houses a museum. There are two cinemas. The harbour is used for coasting and continental trade. Shoreham Beach to the S. of the town, is separated from it by the Adur and is approached by bridges.

Shoreham was an important

port in the Middle Ages, and its chief industry was shipbuilding. The town had formerly a high constable elected annually. From 1295 to 1885 New Shoreham sent two M.P.s to parliament. From 1950 Arundel and Shoreham was the name of a co. constituency. Pop. est. 12,020.

Another Shoreham is a village in Kent. It is 22 m. from London, with a fine old church.

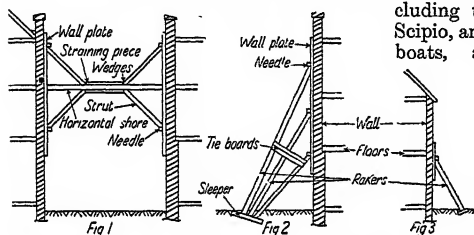
Shore-Line. Thin strip or zone of land lying between the line of low-tide and the line of sea cliffs. The shore is divided into the back-shore, which lies between the base of the cliffs and the normal high tide level, the fore-shore, which lies between high and low tide limits, and the off-shore zone, which is the gently sloping continuation of the shore beyond low-tide level. The classification of shore-lines depends on the relative movement of land and sea that brought the shore into being. Shore-lines of emergence are those which have developed as a result of the rising of the land or the falling of the sea level. They are characterised by gently sloping shores protected by bars behind which are extensive lagoons. Shore-lines of submergence have been formed when the land has sunk or the sea risen; such shore-lines are to be recognized by their very irregular plan view and the prevalence of drowned valleys, *e.g.*, Plymouth, Milford Haven, Hong Kong, etc. Neutral shore-lines are those formed by the building out of the land into the sea, *e.g.* by deltas, volcanoes, coral reefs, where no movement of land relative to sea has taken place. See Coast; Earth Movement.

Shoring. Additional or temporary support to a wall. There are three principal methods of shoring. (1) Where an intermediate portion of a building has been removed, leaving an open space



Shoreham, Sussex. Parish church of S. Mary, a fine specimen of Norman and Early English architecture

between two walls, vertical plates of timber are placed against the two walls, opposite to each other and secured to the walls by short, horizontal pieces let into the brickwork. Horizontal struts are then placed between the vertical plates to resist any outward thrust from the walls, and when necessary the horizontal members are stiffened by raking and vertical scantlings. (2) Where a single wall has to be shored, vertical plates are secured to it as above described, and the outward thrust is resisted by two, three, or more raking struts one



Shoring. Diagram of three methods. 1. Flying shore. 2. Multiple raking shore. 3. Single shore. See text

above another, sometimes braced together, firmly supported at ground level at a distance from the wall and secured to the vertical plates. (3) Where a wall has been weakened at only one point and at no great height, a single raking strut from ground level may be fixed, secured to the wall at the weak spot. The timbers used for these purposes are known as shores.

A dead shore consists of vertical timbers in pairs with horizontal needle timbers on which walls are supported in underpinning operations.

Shorncliffe. Village of Kent, England. Situated 2 m. W. of Folkestone, it has a large military camp first set up in the early 19th century and made permanent in 1855. There Moore trained the Light Division for service in the Peninsular War. In 1923 his statue, by Tweed, was unveiled in the camp. In the First Great War Shorncliffe was a depot for the Canadian army, and in the Second Great War an infantry and artillery training centre.

Short. Name of three brothers, Horace, Eustace, and Hugh Oswald, who founded the oldest established British aircraft manufacturing firm, Short Brothers (Rochester and Bedford), Ltd. They started a balloon factory in Battersea in 1898 and began building aeroplanes in 1908, first at Laysdown, Sheppey, and then from the aerodrome at nearby Eastchurch. Their second original

biplane, in the hands of J. T. C. Moore-Brabazon (later Lord Brabazon), made the first historic circular mile flight in 1909. In 1914 Shorts moved to Rochester, where a succession of outstanding marine aircraft was produced, culminating in the commercial Empire boat of 1936, and its military counterpart, the Sunderland (*q.v.*). This basic design was developed after the Second Great War, when the factory was moved to Belfast. In its early days the firm constructed airships at Bedford. There were other notable Short machines, including the large Calcutta, Scipio, and Singapore flying-boats, as well as the

Stirling (*q.v.*) four-engined bomber. See *Aeroplane* illus. p. 135.

Short, SIR FRANK (1857-1945). British artist. Born June 19, 1857, he was originally trained as an engineer,

but found his vocation as an etcher and engraver, in which he attained the highest honours. He was also a landscape painter. Knighted in 1911, he was made R.A. the same year. Treasurer of the academy, 1919-32, he was also for many years president of the Royal Society of Painter-Etchers. He died April 22, 1945.

Short Circuit. In electricity, the creation—accidental or otherwise—of an additional circuit between two points (*see* Shunt), having a resistance negligible compared with the original circuit through which the current should travel. An example is the short-circuiting of two cores of a cable by an excavator's pick. Since the resistance is so low, the current may be very high, and serious damage and fires may result. Protective methods include the use of fuses (*q.v.*) or circuit breakers (*q.v.*) for opening the circuit and cutting off the supply. In some instances, however, a short circuit serves a useful purpose. The operation of electric automatic rly. signals depends on the short-circuiting by the train wheels of a current which normally passes through the magnet holding a signal "off." See *Circuit, Electric*; *Electricity*.

Shorter, CLEMENT KING (1857-1926). British journalist. Born in London, July 19, 1857, he was educated at Downham Market. His first literary work was for *The Dover Express*. In the civil service,

1877-90, he contributed literary biographies to a Scottish encyclopedia, and piquant literary gossip to *The Star*. Editor of *The Illustrated London News*, 1891, he founded



Clement King Shorter
Hoppe

The Sketch in 1893, and edited both *News and Sketch*, together with *The English Illustrated Magazine*, until 1900. With Hugh Spottiswoode he next founded *The Sphere* (*q.v.*), starting its companion, *The Tatler*, in 1901. From a literary as well as a pictorial standpoint, Shorter introduced a new spirit into illustrated journalism. His weekly literary letter in *The Sphere* was one of the most widely read pages of its day. This bibliophile also won distinction as an authority on the Brontës, Borrow, and Napoleon. He was among the first to appreciate Meredith and Hardy, and published a masterly little *Handbook to Victorian Literature*, 1897. His autobiography appeared in 1924, and he died Nov. 19, 1926.

Shorter married Dora Sigerson (1872-1918), Irish poet and novelist, in 1896. She was born in Dublin, daughter



Dora Sigerson Shorter, Irish poet

of George Sigerson (*q.v.*). In addition to ten volumes of poems, the first of which appeared in 1894, she wrote a novel, *Through Wintry Terrors*, 1907; was a gifted exponent of the short story, as in *The Father Confessor*, 1900, and *The Country House Party*, 1905; and produced books of prose sketches. She died Jan. 6, 1918.

Shorter Catechism. Name given to a confession of faith which sets forth the doctrines of the Presbyterian churches of Scotland. Drawn up by the Westminster assembly of divines in 1647, it received the sanction of the general assembly. It was called shorter to distinguish it from the larger catechism, which was somewhat too difficult for ordinary instruction, and became the popular medium through which Scottish children became acquainted with the various religious tenets and duties. See *Catechism*; *Presbyterianism*; *Westminster Assembly*.

SHORTHAND AND ITS SYSTEMS

W. J. Carlton, Hon. Life Associate, Incorporated Phonographic Society

For correlated topics see *Journalism*; *Newspaper*; *Reporting*.
Consult also the articles on *Gurney*; *Putman*; *Phonetics*; *Writing*

Shorthand is a term applied to methods of handwriting by forms briefer than those in current use, designed primarily for the recording of language with greater speed than is attainable by longhand characters.

Shorthand systems may be divided into three main groups: geometric, script- (or semi-) geometric, and graphic. They may also be classified as orthographic or phonetic, and, again, according to methods of vowel representation. The distinguishing feature of geometric systems is the employment of Euclidean figures, while the characters of script, graphic, or cursive systems are derived from longhand letters. Script-geometric systems admit geometric characters but exclude the vertical and left diagonal slopes

A few systems, such as "Dot and Dash" and the so-called stave shorthands, do not fall within these categories. Phonetic systems seek to provide a stenographic sign for each speech sound, regardless of spelling. Syllabic systems aim at representing each syllable by a single pen-stroke or "inflexion." Stave systems involve the use of staves of three, four, or more bars, usually intersected by perpendicular lines. Practically all systems have for their elements right lines and curves (stems), to which may be attached auxiliary circles, loops, and hooks (appendages); abbreviating devices consisting largely in distinction of length and thickness, position in relation to a real or imaginary line or sign, and diacritical marks. Geometric systems predominate in Western Europe; script or cursive systems are almost exclusively in vogue east of the Rhine. In America geometric and script systems are practised in about equal proportion.

The art of shorthand writing, generally known as stenography outside the British Empire, has become the indispensable handmaid of oratory and commerce. Methods of brief writing were known to the Greeks before the Christian era, and Tiro, a freedman of Cicero, is credited with the invention of a system of *notae* practised extensively by the Romans and highly valued by them. Cato's speech on the Catilinian conspiracy was reported in the Roman senate by the aid of these notes in 63 B.C., and shorthand writing became an accomplishment of emperors and

slaves. Tironian notes disappeared after the decline of the Roman Empire, but the Renaissance brought with it the revival of shorthand.

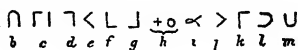
England is the birthplace of modern shorthand. In 1588 Dr. Timothy Bright, physician of St. Bartholomew's Hospital, published, under the title *Characterie*: An arte of shorte, swifte, and secrete writing by Character, the result of experiments on which he had been engaged at least two years earlier. He allocated arbitrary symbols to some 536 key words which had to be memorised, and provided for the formation of others by ingenious modifications:



 a b c d e f g h i j k


 l m n o p r s t u v w x y z

Bright's alphabet

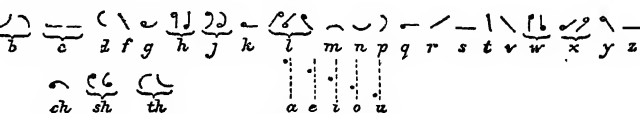
It has been assumed, on inconclusive evidence, that certain Shakespearean plays were reported surreptitiously by this crude contrivance. Bright's work was superseded by that of a London clergyman, John Willis, who devised the first stenographic alphabet capable of being welded into words, and printed his invention in 1602. Willis provided a distinct character for each consonant and leading vowel, expressing medial and final vowels by the position of one consonant in relation to another or by detached dots:


 a b c d e f g h i j k l m


 n o p q r s t u v w x y z ch ck

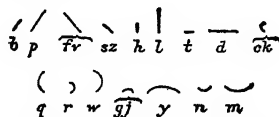
Willis's alphabet

Subsequent system-makers simplified many of Willis's compound characters, and the art was popularised by Shelton, 1626; Metcalf, 1635; and Rich, 1646. Pepys penned his Diary in Shelton's tachygraphy, and Rich's (origi-


 a b c d e f g h i j k l m n o p q r s t u v w x y z

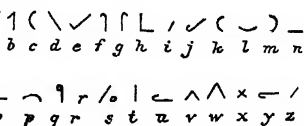
Byrom's alphabet

nally Cartwright's) method was commended by Locke and taught by Doddridge. Ingenuity rather than simplicity characterised early attempts at shorthand construction. A notable exception is an anonymous MS. entitled *Characterisme*, which embodies an alphabet of simple characters grouped in phonetic pairs and differentiated by length:



 p fr sz h l t d ck
 q r w x y n m

Alphabet of "Characterisme"

Shorthand writing became a common accomplishment in the 17th century, the literature of the art including tiny stenographic editions of the Psalms and N.T. The complete Bible was engraved and printed in 1687. In the system of Coles, 1674, syllabic writing and the use of position in relation to the line of writing were first adumbrated. Mason, a London writing-master, produced three successive systems, embodying various improvements, and the last of them was republished by Thomas Gurney, the founder of a family of shorthand writers. He became official shorthand writer to the Old Bailey about 1737 and later to the Houses of Parliament, while he practised in other law courts in London and Westminster. Gurney's method, in which Dickens was an adept, is still in use. The alphabet of the system is as follows:

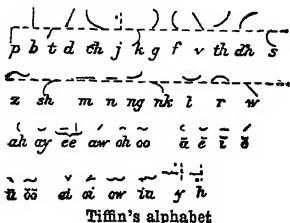

 a b c d e f g h i j k l m n
 o p q r s t u v w x y z

Gurney's alphabet

An important stage in the evolution of the art was marked by John Byrom's invention about 1720. By means of alternative forms he evolved a system which excelled all its predecessors in point of lineality and ease of junction. He was the first to introduce the diagonal quadrants () but the large number of characters with an initial circle militated against speed:

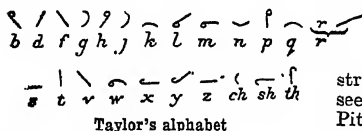
Byrom taught his method extensively (to the Wesleys among others), but it was not published until after his death. He formed a shorthand society in 1726, and his pupils styled him Grand Master.

From the time of Willis the omission of silent letters and writing by sound had been advocated, but the first system constructed on a strictly phonetic basis was that of Tiffin, 1751:

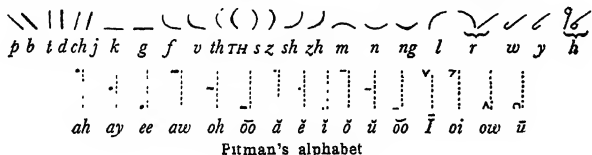


Although the phonetic principle is now generally adopted, an orthographic basis is advocated by some on the score of greater legibility.

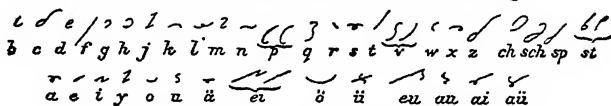
Attempts by Williamson, 1775, and Mayor, 1780, to improve on Byrom's plan led to the publication in 1786 of Samuel Taylor's Essay intended to establish a Standard for a Universal System of Stenography, which was adapted to nearly all the languages of Europe, and secured world-wide fame for its author:



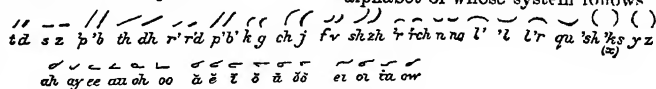
Taylor achieved extreme simplicity by fixity of form and the virtual suppression of vowels, a dot in any position serving to express each of them. Rejecting Byrom's duplicate forms and diagonal quadrants, he allotted one sign to each letter, sacrificing symmetry of outline to the attainment of greater speed. Many expert reporters have been writers of Taylor's system. As modified by Harding, 1823, it was learned by Isaac Pitman, whose Stenographic Soundhand, 1837, was rearranged and issued as Phonography, 1840. Pitman's alphabet consists of simple signs phonetically paired, thick and thin strokes serving for the consonants and light and heavy dots and dashes for vowels:



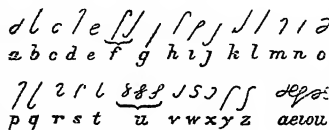
Among the fundamental principles of the system are alternative signs, halving for the addition of *t* and *d*, lengthening for *thr*, *tr*, *dr*, initial hooks for *r* and *l*, final hooks for *n*, *f*, and *tion*. By reintroducing alternative signs to ensure lineality and diversity of outline, and a vowel scale by which the exact vowel could be expressed, Pitman reverted in great measure to Byrom's plan. Pitman's phonography gradually ousted older methods, and the percentage of Pitman writers throughout the British Empire to-day is very high. Its popularity was due to the intrinsic merit of the system, the energy of its inventor, and the enthusiasm of his disciples. The system is founded on a close analysis of the language, and recognizes three stages: the learners', the corresponding, and reporting



styles. In the U.S.A. writers of "Isaac Pitman" are in a minority. A standardised system evolved by the National Shorthand Reporters' Association was intended to supersede the multiplicity of Pitmanic methods varying only in detail—Benn Pitman, Graham, Munson, Longley, Osgoodby, and others. In the struggle for supremacy issue now seems to be joined between the Pitmanic systems and those having a monoslope basis, of which Gregg's is the most conspicuous.



Although Folkingham's Brachygraphy of 1620 contains the germ of the monoslope idea, the first system on that basis was that of Simon Bordley, 1787:



Bordley was followed by Roe, 1802, and Oxley, 1816, in England; and by Thibierge, 1808, Fayet, 1832, and Gabelsberger, 1834, on the Continent. The last-mentioned system, an entirely original one, is the most important representative of the cursive theory. Its success was immediate, and an immense number of societies exist in Germany for its study and propagation. One of its salient features is the use of the connective "hair-stroke" of longhand to indicate the presence or absence of a vowel, and the abbreviating rules enable vowels, consonants, and syllables to be omitted at the writer's discretion. Adopting the view that vowels and consonants are inseparable, Gabelsberger expresses certain vowels by a slight deformation, displacement, or thickening of the consonantal signs:

The system of Stolze, 1841, proved a serious rival to Gabelsberger, and an attempt to combine the best features of both by Schrey, 1887, met with some success. The Sächsische Stenographische Landesamt, formerly the Royal Stenographic Institute, founded at Dresden in 1834, housed the world's most important shorthand library, but many books were destroyed in the air raids of 1945. The originator of script-geometric shorthand was George C. Mares, 1885, the alphabet of whose system follows

The most widely known system of this school for the English language is that of John R. Gregg, 1888. Among its leading principles are blended consonants, vowel group signs, and the assignment of upstrokes to the dentals to preserve lineality. A comprehensive list of prefixes and affixes compensates for lack of abbreviating power of compendious signs. (See next page.)

The problem of vowel representation has greatly exercised shorthand system framers, and the diversity of theories is so great that classification is difficult. In the older systems the disjunction of two consonants indicated an intervening vowel, the nature of which was determined by the relative position of the consonants, a

plan revived by Everett, 1852, and some other modern inventors. Detached dots for all vowels were introduced by Byrom, who wrote the consonants in sequence and allotted five positions for the vowels in close juxtaposition to the consonantal signs. Stackhouse, 1775, and Blanchard, 1779, provided alphabetic characters for vowels, to be joined to the consonants in their natural order. Towndrow, 1841, represented the vowels by the same signs as the consonants, preceded by a circle, and Bishop, 1886, applied this plan to Pitman's system. In many modern styles the presence, place, and in some cases the exact nature of the vowel are shown by varying the length, form, or position of the preceding or following consonant.

Melville Bell, 1855, provided consonants of three lengths, the longest implying a preceding vowel, the normal length a following vowel, and the shortest indicating

ciples. Much depends on the object in view. A system admirably adapted for personal use, such as keeping a diary or making extracts, may be of little or no use for reporting a rapid speaker where speed is the primary requisite, or even for taking down from dictation. Machine shorthand (stenotypy) is practised extensively in the U.S.A. Shorthand writing is a mental as much as a manual process, the writer counting for more than the system. Shorthand systems have been devised for recording musical compositions, for chess notation, and for the use of the blind.

The first international shorthand congress took place in London in 1887. It was followed by others in France, Germany, U.S.A., Sweden, Belgium, Spain, Switzerland, Italy, Hungary, and Holland. At the London congress of 1937 the centenary of Pitman's and the jubilee of Gregg's shorthand were commemorated. Professional short-

antiquity, but it was not until nearly the close of the 18th century that the breed was scientifically developed by a little group of British farmers. The breed is still widely known as the Durham.

Shorthorns vary in colour from pure red to white, but a roan blend is the most common. The horns are short, curved, and flat, and may tend to turn either upwards or downwards. The body is symmetrical and very bulky in proportion to the size of the skeleton. The breed is of the general utility type, ranking high as a milk-producer. It matures speedily and attains great weight. *See Bull; Cattle, colour plate.*

Shorthouse, JOSEPH HENRY (1834-1903). British novelist. Born in Birmingham, Sept. 9, 1834,

of Quaker parents, he was educated at Tottenham, and then entered his father's business of chemical manufacturer. He became a convert to Angli-

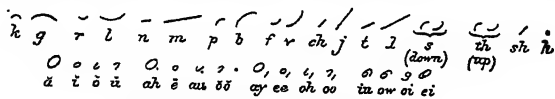


J. H. Shorthouse,
British novelist

canism at the age of 27, and his strong Anglo-Catholic sympathies are reflected in his romance, *John Inglesant* (q.v.), published first privately and then by Macmillan in 1881. The book attracted the attention of Gladstone, Huxley, Cardinal Manning, and others, and brought its author great fame. His other works include *Little Schoolmaster Mark*, 1883; *The Countess Eve*, 1888; and *Blanche, Lady Falaise*, 1891. Shorthouse died at Edgbaston, March 4, 1903. *Consult Life, Letters, and Literary Remains*, edited by his wife, 1905.

Shortness. Term used in metallurgy to denote brittleness in metals. This brittleness may occur at temps. either above or below the recrystallisation temp.; if above, it is termed hot shortness, if below cold shortness. The phenomenon is of considerable practical importance, because within the shortness temp. range the metals cannot accommodate strains, and therefore crack. Shortness is frequently the reason for the presence of cracks in castings where restraint of the normal thermal contraction during cooling has given rise to strain.

Short Sight. Error of refraction due to excessive elongation of the eyeball, so that the image falls short of the retina. It is corrected by the use of spectacles. *See Eye; Myopia, Sight.*



Gregg's alphabet. *See previous page*

the absence of any vowel. Pocknell, 1881, also contrived an alphabet of triple characters, each consonant being represented by a straight stroke and two opposite curves of the same length and slope, the cavity of the curve implying the presence of a vowel. The subordination of consonants to vowels has been attempted more or less successfully in some systems, notably those of Fielding, 1892, in which the so-called "back strokes" are assigned to vowels and the "forward strokes" to consonants, and Walpole, 1921, in which vowels are represented by straight lines and consonants by curves. The latter system was substituted for Pitman's by its author in his professional practice.

Among other systems for the English language in current use are Sloan-Duployan, "Oxford," and Dutton's. The trend of modern shorthand development has been mainly in three directions: (1) brevity by geometric signs, (2) legibility by connective vowels, (3) fluency by monoslope characters. Attempts to impose a unified system under the aegis of the state in Germany, Italy, and the U.S.S.R. have been only partially successful. There is no "best" system, excellent work having been done with systems based on totally different prin-

hand reporters are represented in Great Britain by the Institute of Shorthand Writers and the Association of Official Shorthand Writers. The oldest shorthand society in the world is the Incorporated Phonographic Society, which seeks to promote the interests of Pitman writers, while the National Gregg Association caters for those who use Gregg's. The Stenographers' Club, Oxford, is open to writers of all systems who have attained a minimum speed of 80 words a minute.

Bibliography. *Historical Account of Shorthand*, J. H. Lewis, 1816; *Geschichte und Literatur der Geschwindschreibkunst*, J. W. Zeibig, 2nd ed., 1878, suppl. 1899; *Historische Grammatik der Stenographie*, K. Faulmann, 1887; *Histoire Générale de la Sténographie*, A. Navarre, 1909 (unreliable for English shorthand); *History of Shorthand*, I. Pitman, 4th ed., 1918; *Stenografiens Historia*, O. W. Melin, 1927-28; *Selections from the Story of Shorthand*, J. R. Gregg, 1933; *Allgemeine Geschichte der Stenographie*, C. Johnen, 4th ed., 1940; and *Proceedings of International Shorthand Congresses, 1887-1937*.

Shorthorn. Breed of domestic cattle. Of British origin, its merits and remarkable adaptability to almost any climate have caused it to become distributed throughout the world. It is of considerable

Short Story. The earliest form of this kind of fiction is the folk tale, originally oral but recorded in some form of writing at an early stage of history, e.g. by the Egyptians. Other early forms were fables of animal life such as inspired the Greek collection known as Aesop's Fables; narrations in the Hebrew scriptures, as retained in the Old Testament; and the parables of Jesus and the Buddha. Of ancient Greek short stories a good example survives in the *Widow of Ephesus*, in the Latin of Petronius, which also gives an example of one of the beautiful old myths in *Cupid and Psyche*.

After the decline of Greco-Roman culture the short story remained as an ornament to Christian sermons as well as in medieval stories of love and adventure like *Aucassin and Nicolette*, and in popular tale-tellers' collections like *The Arabian Nights Entertainments*. French minstrelsy produced in the *Fabliaux* the germ of the modern short story. The Italians expanded the art into the form of brilliant little novels such as those contained in Boccaccio's *Decameron*. Until the 19th century the short story throughout Europe was usually told in that form or in the guise of a folk tale, in either case presenting a direct, circumstantial narrative, with little shape. Such tales were frequently interpolated into longer novels in the early days of the novel. Examples are to be found in the works of Sterne and Scott, and as late as Dickens's *Pickwick Papers* and Nicholas Nickleby.

It was an American writer, Edgar Allan Poe, who first developed the short story as a conscious art, by making it concentrate on a single direct effect and studiously eliminating any paragraph or epithet that did not contribute to that effect. Poe had little immediate influence on English writers, but Frenchmen like Baudelaire, Mérimée, Gautier, Flaubert, and Daudet were quick to follow his ideas, and produced short stories that challenged comparison with the art of the novel both as powerful means of expression and as things deeply satisfying in themselves by reason of their form. Maupassant carried the art even further, distilling into miniature compass both the life around him and the life within him, and hundreds of European writers followed his formulas, which formed the base of most popular instruction in the winning of wealth or fame by the writing of short

stories. The French themselves were leaders in the business of transforming anecdotes into Maupassant-like *contes*. Their newspapers began to reserve space every day for a little tale, at the foot of a page. For this a style of vivid conciseness was required, together with a literary effect which could compete with the news in attracting attention. The practice produced many masters of brevity, though at the total expense of depth.

The English Short Story

Among a rising generation of English writers a spirit of emulation was aroused. The great period of the English short story began in the mid-1880s and had passed its zenith by the end of the century. R. L. Stevenson was directly inspired by Poe, Kipling by both Poe and Maupassant; but each gradually evolved a method of his own. These were the leaders. Other names associated with this period of fine flowering, when every literary aspirant was anxious to excel in the short story, include Barrie, Morley Roberts, Gissing, H. G. Wells, Stephen Crane, Conrad, Jerome K. Jerome, George Moore, Grant Allen, George Egerton, Henry Harland, and Arthur Morrison. Such periodicals as the *National Observer*, the *Fortnightly Review*, *Longman's Magazine*, and later the *New Review* and the *Yellow Book* gave every encouragement to the art.

The advent of the popular sixpenny magazines during the 1890s created a vast new public for the short story, and this led inevitably to the commercialising of the formula, a reduction of the art to terms consistent with what this new public was supposed to want. It is significant to note that Arnold Bennett's first literary effort, a short story, was originally sent to *Tit-Bits* and was rejected as unsuitable; but it was accepted and printed in the *Yellow Book*. Yet virile and imaginative writers for a long time set a high standard even within the conventions of the sixpenny magazine. Conan Doyle, who with Sherlock Holmes and Brigadier Gerard first made popular the series type of short story in which the chief character reappeared regularly from tale to tale is an outstanding example. But the popular magazines may also claim to have discovered and fostered such great masters of the short story as W. W. Jacobs, Pett Ridge, and P. G. Wodehouse and in America the imitable O. Henry. Kipling's *Stalky*, Chester

ton's *Father Brown*, and Cutcliffe Hyne's *Capt. Kettle* all first saw the light in short stories in popular magazines.

Meanwhile, the Russian writer Chekhov had startled a new generation of readers and writers by the subtlety with which he could use his short stories as the vehicle of his own sad, if courageous, despair. His influence upon the art, which was widespread, was the reverse of Maupassant's, his technique being calculated to emphasise depth of feeling. His stories were not intended to amuse or to arouse, rather they invited readers to feel and share, if only for a few moments, in the essential human tragedy. Among writers in English no disciple of Chekhov was perhaps more successful than Katharine Mansfield.

Yet the truth is that no limitation of form or content can be put upon the short story except in the one matter of length. H. G. Wells once wrote that the only essential of a short story is that it should take from 15 to 50 minutes to read aloud. Most people would agree at least with the upward limit. Otherwise, the short story is a myriad-mirror of a many-sided world and of our own many-sided natures. It can be objective or subjective, have a purpose or no purpose, be profound or flippant, all atmosphere or as hard and dry as a nut, romantic or realistic, sentimental (e.g. O. Henry) or sardonic (e.g. Maugham, H. H. Munro). It can open little windows on worlds distant or imaginary. It can give vivid new meaning to the infinitely small or to the whole universe or to both at once.

Of anthologies none is more representative than the *Masterpiece Library of Short Stories*, ed. J. A. Hammerton, 20 vols., 1920. Consult also *The Short Story*, S. O'Faoláin, 1948.

Shoshone Falls. Noted waterfalls on Snake river, Idaho, U.S.A. The river makes a first descent of 30 ft. through a number of rocky channels, and then drops 190 ft. in one vast sheet, 1,000 ft. in breadth. During the flood season the volume of water is little less than that of Niagara. See illus. p 7536

Shoshong. Town of Bechuanaland, S. Africa. It stands at an alt. of 3,310 ft., on the fringe of the Kalahari Desert, about 120 m. N.E. of Mopolole. It was formerly the capital of the Bamangwato, under Khama, who vacated the town for Palapye and afterwards for Serowe



Shoshone Falls, Idaho. Cataract and falls from the left bank of the Snake River. See p. 7535

Shoshoni. Group of North American Indian tribes in Wyoming, Idaho, and Nevada. Sometimes called Snake Indians, they number some 3,000. They give their name to the widespread Shoshonean family. See American Indians, colour plate.

Shostakovich, DMITRY DMITRYEVICH (b. 1906). Russian composer. Born Sept. 25, 1906, he was taught music by his mother, a fine pianist. In 1919 he entered the Leningrad Conservatoire, and in 1926 his first symphony was an instantaneous success in Leningrad. His seventh symphony, written, and first performed by a scratch orchestra, in Leningrad during the siege of that city in the Second Great War, was widely acclaimed in Russia, but was less successful abroad. With Prokofiev and Khachaturian, he was in 1948 attacked by the central committee of the Russian Communist party. His music was said to show "anti-democratic tendencies alien to the Soviet people and their artistic tastes;" he publicly admitted the charge and repented. His works included the operas *The Nose*, *Lady Macbeth of Olzensk*; the ballets *The Golden Age*, *Clear Stream*; nine symphonies; a cello sonata; a concerto for piano; and music for films.

Shotley. Village of Suffolk, England. It stands near the coast, on the Orwell, 10 m. S.E. of Ipswich and 2 m. N.W. of Harwich. Here are fortifications commanding the entrance of Harwich harbour, and a naval training school for boys. Boys entering for seamen ratings spend a year at H.M.S. Ganges, as the shore establishment is called.

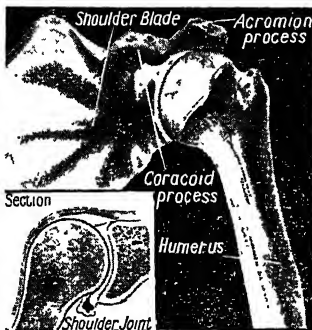
Shottery. Village of Warwickshire, England, 1 m. from Stratford-on-Avon. A thatched half-timbered cottage, with gable facing the road, is preserved by the Shakespeare Birthday Trust as the

home of Anne Hathaway (*q.v.*), and the scene of Shakespeare's courtship. Acquired by the trust in 1892, it has an old-world garden.

Shotts. Parish and village of Lanarkshire, Scotland. The village, 21 m. E. by S. of Glasgow, has passenger and goods railway stations. Coal

mines, iron foundries, brickworks, and a spinning factory give employment to a pop. of 17,000. The parish takes in several mining villages.

Shoulder Joint. Ball-and-socket joint formed between the head of the humerus or bone of the upper arm, and the curved, shallow depression known as the glenoid cavity of the shoulder blade. The shoulder joint is the freest of all the joints in the body, permitting movements of the arm at the shoulder in every direction. The joint is surrounded by strong ligaments and muscles, and is further protected by a bony arch formed by the end of the clavicle, or collarbone, and partly by the coracoid process of the shoulder blade which overhangs the joint, and forms, as it were, a secondary socket for the head of the humerus.



Shoulder. Diagram showing relative positions of the bones. Inset, section of shoulder joint

In spite of the strengthening of the joint, dislocation of the shoulder occurs as frequently as dislocation of all the other joints of the body together. This is mainly due to the shallowness of the glenoid cavity, and the laxity of the ligaments necessary to permit the great freedom of movement. The dislocation usually

results from falls on the hand or elbow, when the arm is widely outstretched. The head of the humerus may be displaced in one of several directions, giving an appearance of flattening of the shoulder with rigidity, bruising, and other abnormal signs. Reduction can be effected by manipulation or extension of the limb by skilled hands, usually under an anaesthetic. See Dislocation.

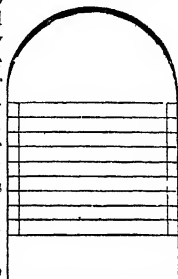
Shove - ha'penny. Game played with five small metal disks which are pushed with the base of the thumb

along a board divided by lines into nine equal spaces or beds, and having a cushion round the edges. The game was played by the ancient Egyptians, and was introduced into England after the Crusades, when, as today, it became popular in taverns. The coin most commonly used in Tudor England was a shilling, especially one coined for Edward VI, called a shovel-board shilling. Later, pennies and halfpennies were used, but the game is now played with nickel or brass disks having a hole in the centre.

Any number of players may take part, and each has five consecutive shoves at a time, counting his score when all five have been shoved. The object is to score three points in each of the nine beds, so that 27 points are required to win. If a player scores more points in any one bed than he needs, the next man may claim the excess score if he requires it for that bed. Convention varies as to how close to the line the disk may lie to be counted as in. A disk shoved off the board goes out of play.

Long in ill-repute, the game about 1935 gained respectability, and now in the S. of England contests are held before large audiences. In 1937 there was a "gate" of 2,000 to watch a final at Reading, and in 1938 the B.B.C. included a match in a television programme.

Shovell, SIR CLOUDESLEY OR CLOWDESLEY (1650-1707). English sailor. He was born at Cockthorpe, Norfolk, and went to sea as a lad. After service in the Mediterranean, he commanded the *Edgar* in the battle of Bantry Bay



Shove-ha'penny board

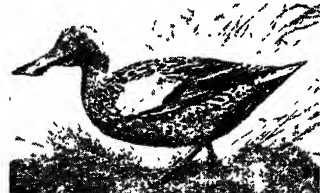
(*q.v.*), being knighted in 1689 for his gallantry, and given command of a squadron. He distinguished



Sir Cloudesley Shovell,
English sailor

himself in the battles of Beachy Head, 1690; La Hogue, 1692; and Dunkirk, 1695; was M.P. for Rochester, 1698–1707; took part in the capture of Gibraltar and served at Malaga, 1704; and being appointed admiral and commander-in-chief of the fleet, fought at Barcelona and Toulon. On his return his ship, Association, was wrecked on the Bishop and Clerk rocks, Scilly Islands, when 800 of the officers and crew were drowned, Oct. 22, 1707. Shovell, it was discovered 30 years later through a woman's dying confession, was thrown ashore at Porthellick Cove, still alive, but was killed for an emerald ring on his finger. He was buried in Westminster Abbey.

Shoveller (*Spatula clypeata*). Species of the duck family, remarkable for its broad and spoon-like bill. The plumage of the drake, green on the head, dark brown on the back, pale blue on the shoulders, brown and white on the wings, and chestnut on the breast, makes it the handsomest of the duck family. Widely dis-



Shoveller. Broad-billed species of duck with mottled plumage

tributed over Europe, Asia, N. Africa, and N. America, it occurs in Great Britain as a winter visitant, but breeds in a few places in England, the Hebrides, and Ireland.

Shrapnel. Type of shell containing a large number of bullets which are released and travel forward at high velocity when the shell is opened by the bursting charge. It was invented in 1784 by Colonel Shrapnel (*v.i.*), and adopted in 1803 by the British army. It was used extensively in the First Great War, especially against troops in the open. In the Second Great War shrapnel shell was replaced by the fragmentation

shell and bomb, in which the break-up of the outer metal case was controlled to give fragments of definite size and velocity range. Both types of shell are usually fused so as to burst in the air at a specified range and height, and are effective against troops in slit trenches. See Ammunition; Artillery; Shell.

Shrapnel, HENRY (1761–1842). British soldier. Born June 3, 1761. He entered the Royal Artillery in 1779, and in 1784 began at his own expense the experiments which eventually led to the invention that bears his name. Shrapnel shell appears to have been first

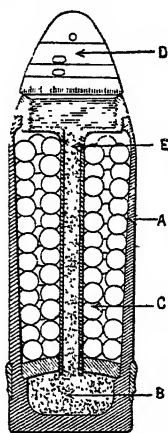


Henry Shrapnel,
British soldier
After F. Arrowsmith

used at the siege of Surinam in 1804, and its efficacy was acknowledged in the Peninsular War and at Waterloo. Shrapnel retired from the active list with the rank of major-general in 1825, and died at Southampton, March 13, 1842. Numerous other innovations in connexion with artillery testify to his inventive skill.

Shreveport. Second city of Louisiana, U.S.A., the capital of Caddo parish. It stands on the Red river, 170 m. E. of Dallas, and is served by the Texas and Pacific and other rlys. There is steamer connexion with New Orleans. Shreveport, which was settled in 1836, incorporated after three years, and raised to civic rank in 1871, boasts that within a century it has come "from wigwags to skyscrapers." This is largely the result of petroleum beds being discovered nearby in 1910. Other industries are concerned with cotton goods and timber. A third of the 98,167 inhabitants are negroes.

Shrew. Family of small insectivorous mammals (*Soricidae*). There are numerous species distributed over most of the tropical and temperate regions of the world. In general appearance most of them resemble mice, but they usually have long and conspicuous snouts. In Great Britain the shrews are represented by five species. The common shrew (*Sorex araneus*) is



Shrapnel shell shown in section. A, case; B, bursting charge; C, bullets; D, fuse; E, central tube of explosive material

not quite 3 ins. long in body and has a tail about 1½ ins. It is brownish-grey on the back and grey or pale buff below. Sometimes the fur is much darker approaching black, while very rarely white patches are present. The ear is very small and is rounded in outline. Common in most parts of England and Scotland, but not occurring in Ireland or the Hebrides, this animal lives in burrows in banks. The food consists of insects, snails, and worms.

The pygmy shrew (*S. minutus*) is the smallest British mammal, little more than 2 ins. long in body. Otherwise its general appearance is that of the common shrew; but the fur is brighter and more silky. It is abundant in Ireland and the W. islands of Scotland; but elsewhere is very local, occurring most frequently in the S. of England.

The water shrew (*Neomys fodiens*) has a total length of slightly over 6 ins., of which more than half is taken up by the tail. Its fur is blackish-grey above and whitish below, and sometimes there is a reddish tinge on the throat. Common in England and Wales, rare in Scotland, and absent from Ireland, it lives in burrows beside streams and ponds, and the entrance is under the water. See Jumping Shrew.

Shrew Mole. Mammal more correctly known as Mole Shrew and so entered in this work.

Shrewsbury. Mun. borough and county town of Shropshire, England. It stands on the Severn 163 m. N.W. of London and 43 m. N.W. of Birmingham, and has a rly. station. The town stands on a peninsula formed by the river across which bridges lead to the suburbs, Abbey Foregate, Frankwell, Kingsland, Bellevue, Colcham.



Shrew. Common shrew, the mouse-like insectivorous mammal

Of several churches the chief are the abbey church of Holy Cross with its Norman nave—part of the



Shrewsbury arms

rebuilt in the 18th century, excepting the towers; S. Chad's was entirely rebuilt, and S. Giles much restored. There is a R.C. cathedral. Secular buildings include the old market hall of the 16th century, the council house, and the drapers' hall of about the same date, a modern guildhall, shire hall, corn exchange, and Royal Salop infirmary. The streets are made picturesque by many wooden houses. A museum and library occupy the old grammar school building. The castle has been much modernised, but some parts of the

Norman building still stand; and there are slight remains of the town's fortifications. Noted for its cakes and ale, Shrewsbury's other industries include glass staining, malting, iron founding, and the making of agricultural implements, motor vehicles, safes, and corsets.

Known as Pengwern, Shrewsbury was the capital of the kingdom of Powis before it was taken by the English and added to Mercia. It was then called Scrobcesbyrig, from which its present name has developed. It figured prominently in the wars against the Welsh, for its position on the borders made it a strategic centre, and the Normans built here a castle, which doubtless replaced a Saxon fortress. The battle of 1403 is described below. Shrewsbury secured several charters and was a corporate town with a gild merchant in the Middle Ages. From 1295 to 1885 it had two M.P.s, thereafter one, now giving its name to a co. constituency. Mkt. days, Wed. and Sat. Pop. 44,430.

Shrewsbury, BATTLE OF.

Fought July 21, 1403, between Henry IV of England and a combination of his enemies. Led by Sir Henry Percy (Hotspur), the Percys rebelled, and, with a few Scots, seized Chester, where they waited for their Welsh allies. The two armies reached

Shrewsbury almost simultaneously, but Henry secured the town, while the Percys were encamped on Hayteley Field, 2 m. to the N. Henry marched out of Shrewsbury, and after futile negotiations the battle began. At first the royalists suffered heavily from the archers of their foes, who then charged, but after a severe struggle the king's superior numbers began to tell. Hotspur was killed, and his followers fled. Other leaders were taken prisoners and beheaded. Both sides lost heavily, about 1,600 being killed altogether, but the rising was scotched.

Shrewsbury, CHARLES TALBOT, DUKE OF (1660-1718). English statesman. Born July 24, 1660,

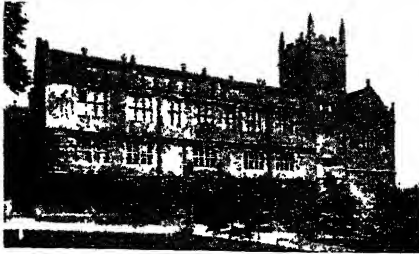


Duke of Shrewsbury, English statesman
After Kneller

son of Francis, 11th earl of Shrewsbury, he held various minor offices under Charles II and James II. He was one of the seven who formally invited William of Orange to occupy the English throne. William appointed Shrewsbury his secretary of state, 1689-90 and 1694-1700. But Shrewsbury's career was impeded by vacillation. His one consistency was the support of the Protestant succession, and as lord high treasurer in 1714 he took the principal part in securing the accession of George I. He had been a duke since 1694, and died at Isleworth, Feb. 1, 1718, when the title became extinct. *Consult* his Correspondence, ed. Coxe, 1821.

Shrewsbury, EARL OF. English title borne since 1442 by the family of Talbot. Its holder ranks as the premier English earl. William the Conqueror handed over the county of Shropshire to Roger Montgomery, one of the Norman invaders, who styled himself earl of Shrewsbury, his castle being there. His descendant, Robert, lost his earldom and estates in 1102 for rebelling against Henry I.

In 1442 the soldier John Talbot (v.i.) was made earl of Shrewsbury. His son John, lord high treasurer, was killed at the battle of Northampton by the Yorkists. Descendants of the 1st earl kept the title, although it did not follow the direct line, and in 1668 it came to Charles Talbot (v.s.) as 12th earl. He was made a duke in 1694, but as he had no sons this title lapsed on his death in 1718. The earldom, however, passed to a



Shrewsbury, Shropshire. 1. Museum and Free Library occupying the old school building. 2. The castle founded in 1070. 3. Gateway of the old council house. 4. Abbey church, founded in the 11th century

cousin, Gilbert Talbot, from whom the subsequent earls are descended. The 20th earl (1860-1921) was the first to start cabs fitted with noiseless tires, both in London and Paris. His grandson John (b. Dec. 1, 1914) became 21st earl. He is also earl of Waterford, an Irish title given to the 1st earl in 1446. His chief seat is Ingestre Hall, Stafford, his estates being mainly in that county and in Cheshire. The earl's eldest son is called Viscount Ingestre. See Alton Towers.

Shrewsbury, JOHN TALBOT, 1ST EARL OF (c. 1388-1453). English soldier. Son of the 4th baron



1st earl of Shrewsbury, English soldier

Talbot, he was appointed lieutenant of Ireland in 1414 and busied himself in subduing the natives. He served in the French war in 1419, and on his return engaged in a bitter feud with the Ormondes, but in 1427 he went again to France, where he was made governor of Anjou and Maine, and took part in the siege of Orléans. Defeated and captured in 1429 at Patay, he remained in captivity until 1433. Next year in France he conducted another successful campaign, being made governor and lieutenant-general of France and Normandy in 1439. Created earl of Shrewsbury in 1442, he was killed at the battle of Castillon, July 17, 1453.

Shrewsbury, ARTHUR (1856-1903). English cricketer. Born in Nottingham, April 11, 1856, and educated there, he became a professional cricketer about 1874, and until 1902 was one of the leading members of the Notts eleven. Four times he went with teams to Australia. In 1887 his batting average was 78, and five times he was at the head of the averages. He was in business as a sporting outfitter in Nottingham. On May 19, 1903, he shot himself.

Shrewsbury, ELIZABETH TALBOT, COUNTESS OF (1518-1608). English peeress known as Bess of Hardwick. The daughter



Bess of Hardwick, Countess of Shrewsbury National Portrait Gallery

married Sir William St. Loe, and in 1568, George, earl of Shrewsbury (d. 1590). She died Feb. 13, 1608, and is buried in All Saints' Church, Derby. She had six children by Cavendish, two of whom founded the ducal houses of Devonshire and Newcastle. A daughter was the mother of Arabella Stuart. Very wealthy and a great builder, she was responsible for Hardwick (q.v.) and Chatsworth (q.v.).

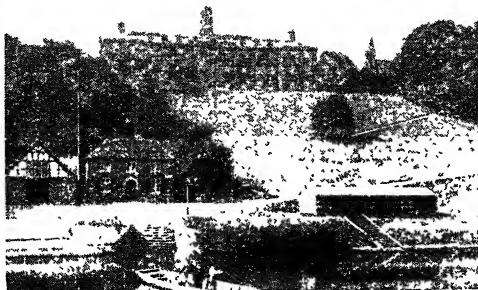
Shrewsbury School. English public school. Founded in 1552 by Edward VI, it has accommodation for about 450 boys, all of whom, except a few day boys, live in eight houses. The buildings include library and picture gallery, in addition to the usual requirements of a large school. Until 1882 the school was in the town, but in that year it was removed to a site at Kingsland, just outside. The Severn flows by it, and consequently rowing is one of the regular sports. Shrewsbury owes its growth to a grammar school to a large public school primarily to Dr. Samuel Butler, headmaster, 1798-1836, but it was under Dr. Kennedy, 1836-66, that it won a high reputation for scholarship.

Shrike (A.S. *scric*). Correct name for the butcher bird, first applied by Turner (1544) to the

of John Hardwick, of Derbyshire, she was married in 1532 to John Barlow, and in 1549 became the third wife of Sir William Cavendish. After his death in 1557, she married Sir William St. Loe, and in 1568, George, earl of Shrewsbury (d. 1590). She died Feb. 13, 1608, and is buried in All Saints' Church, Derby. She had six children by Cavendish, two of whom founded the ducal houses of Devonshire and Newcastle. A daughter was the mother of Arabella Stuart. Very wealthy and a great builder, she was responsible for Hardwick (q.v.) and Chatsworth (q.v.).



Shrewsbury School arms



Shrewsbury School. The school and boat-house Frith

great grey S. (*Lanius excubitor*). The genus *Lanius* includes about 50 species of world-wide distribution, with the exception of S. America. Only one, the red-backed S. (*L. collurio*), breeds in Great Britain; but others, the great grey S. (*L. excubitor*), the lesser grey S. (*L. minor*), and the wood-



Shrike. Great grey shrike, a winter visitant to Great Britain W. S. Berridge, F.Z.S.

chat (*L. senator*), are winter visitors, the first regularly, the others occasionally. See Butcher Bird; Eggs, colour plate.

Shrimp. Popular name for a number of small decapod crustaceans, but applied particularly to the edible brown shrimp (*Crangon vulgaris*). The brown colour is not a character of the living shrimp, but is due to cooking, like the redness of the prawn and lobster. The natural tint of the shrimp is greenish grey speckled with brown. It differs from the prawn (q.v.) in several respects;



Shrimp. common edible species found in the shallow waters around the British coasts

the carapace or helmet which covers the head and fore-part of the body is not extended forward into a long rostrum; only one pair of antennae are at all long; and there are no nippers to the walking feet.

It swarms in huge numbers, and forms a considerable part of the food of flat-fish and other shallow water species. It feeds on minute marine organisms and debris, swimming over the sand (to which its coloration assimilates) by incessant motion of its swimmerets, and with these when alarmed it sinks itself into the sand and becomes invisible. These swimmerets are utilised also by the

female for carrying her numerous eggs. A slightly different species (*C. allmanni*) is found in deeper water off the coasts of Great Britain and Norway: this and the banded shrimp (*C. fasciatus*) are sometimes regarded as constituting a separate genus (*Egeon*). Shrimps are caught in a large net attached to a T-shaped handle which is pushed over the submerged sands by the wading shrimp. See Crustacea.

Shrine (A.S. *scrin*, ark of the covenant, from Lat. *scrinium*, writing-desk, chest). Box or reliquary in which were placed the relics of saints. Shrines were often lavishly adorned with jewels and took the form of a church. The term shrine was also applied to a saint's tomb, and hence in a more general sense to the church or cathedral in which it was the object of veneration by pilgrims. See Cave Temple; Dagoba; Santiago de Compostela.

Shrivenham. Village of Berkshire, England. Situated 6 m. N.E. of Swindon, it was a U.S. army base in the Second Great War. In 1945 there was set up here an educational establishment to prepare U.S. soldiers proceeding to universities on demobilisation. Shrivenham church has a 15th century tower and 13th century font.

Shropshire or **SALOP.** County of England. With an area of 1,347 sq. m., it is bounded on the W. by



Shropshire arms

Wales and is crossed by the Severn. Except for the Wrekin, the upper or N. portion is level, but the rest is generally hilly. Ranges are the Cleve Hills, Wenlock Edge, and the Breidden Hills; the highest point is Brown Cleve, 1,800 ft. Shropshire is of outstanding interest to the geologist, who finds some of the oldest rocks in the British Isles. The Severn and its tributaries, Rea, Roden, and others, water the county, which contains a number of lakes or meres, of which Ellesmere is the largest. Clun Forest and the Wyre Forest are rough, infertile regions in the south.

Shropshire is in the main an agricultural county, although there is a coalfield in the E. around Coalbrookdale, where Abraham Darby revolutionised the iron ore industry in the 18th century. Barley, oats, wheat, and other crops are produced. The Shropshire sheep



Shropshire. Map of the English agricultural county on the border of Wales

are a noted breed, while cattle are reared, and there are many dairy farms. The co. is served by rlys. and several canals. Shrewsbury is the co. town, and places of great historical interest include Ludlow, Wenlock, and Oswestry. Other places are Wellington, Bridgnorth, Newport, Whitechurch, Market Drayton, Shifnal, Oakengates, Bishop's Castle, and Church Stretton. Shropshire has many evidences of Roman occupation, but its history is mainly that of a border shire, alert to repel the inroads of the Welsh. Herein are the Roman Uriconium (Wroxeter), Offa's Dyke, and the remains of many castles built by the Normans. Four members are returned to parliament. The county is in the dioceses of Lichfield and Worcester. Pop. 244,156.

LITERARY ASSOCIATIONS. These may be said to begin with Piers Plowman, for Langland is supposed to have been born at Cleobury Mortimer. Farquhar wrote The Recruiting Officer at Shrewsbury. In the council hall of Ludlow Castle Milton's *Comus* was performed, 1634, and in the castle gatehouse Samuel Butler wrote much of *Hudibras*. The Ludlow district inspired much of the poetry in A. E. Housman's *A Shropshire Lad*, and the whole

county gives background to the novels of Mary Webb, born at Leighton. At Clive Hall, near Wem, Wycherley was born. Clun Castle is the Garde Doloureuse of Scott's *The Betrothed*, and Boscobel, scene of Charles II's escape, affords the subject of one of Ainsworth's romances. The *Victoria History* of the co. appeared in 1908; a vol. in the *Land of Britain Series*, 1942; consult also *Shropshire Hills*, Timperley, 1948.

Shropshire Light Infantry, KING'S. Regiment of the British army formed in 1881 by an amalgamation of the 53rd and 85th Foot. Raised in 1755, the 53rd took part in the American and European campaigns of the late 18th century, and was at the defence of Gibraltar. In 1782 it became the Shropshire Regiment, and served in the Peninsula under Wellington. After Waterloo it went to St. Helena for three years to provide guards for the exiled Napoleon. Then followed service in the Sikh war of 1844, the Crimea, and the Indian Mutiny.

Raised in 1793 by Colonel Nugent as the Bucks Volunteers,



Shropshire Light Infantry badge

the 85th Foot won its first battle honour under the duke of York at Nieuport, 1793, being the only British regiment to hold that honour. Converted to light infantry in 1808, it won nine battle honours in the Peninsula, and then served in the American war of 1812-14. In 1815 it was given the title The Duke of York's Own, but in 1821 this was altered to The King's Light Infantry. In the Indian Mutiny the 85th formed part of Campbell's force that relieved Lucknow.

From 1881 the 53rd and 85th Foot were the 1st and 2nd battalions of the King's Shropshire Light Infantry. This regiment fought in Egypt and the Suakin campaign, and throughout the S. African War, having a major share in the Boer defeat at Paardeberg. Thirteen battalions were raised for service in the First Great War and earned the battle honours: Armentières, 1914; Ypres, 1915, '17; Frezenburg; Somme, 1916, '18; Arras, 1917, '18; Cambrai, 1917, '18; Bligny; Épehy; Dorian, 1917, '18; Jerusalem. In the Second Great War, they served as lorried infantry in N. Africa, Italy, and Europe. The depot is at Shrewsbury.

Shroud (Old Eng. *scrud*, a garment). Sheet of white cloth in which a corpse is wound for burial. In nautical usage, the shrouds are the ropes stretching from the masthead to the ship's side and supporting the mast. (*See Ship*.)

In engineering shrouding is a flange brought up around the teeth of a wheel to give added strength, or a similar flange on other members for protection.

Shrove Tuesday (A.S. *scrfan*, to shrive). Day preceding Ash Wednesday. As the last day before Lent, in medieval times it was largely a day of preparation for the Lenten fast, penitents being then shriven, whence the name. The day was also characterised by merry-making and feasting, a relic of which is the eating of pancakes, this giving the popular name of Pancake Day. The French equivalent is Mardi Gras (*q.v.*).

Shrub (A.S. *scrob*, scrub, undergrowth). Horticultural term for any perennial, hard-wooded plant which has branches springing immediately from the roots or ground level. Its application appears merely to rest upon convention and custom, in order to distinguish a shrub from a tree, which has a solitary trunk rising for some distance from the ground before the branches are produced.

Some flowering shrubs, such as rhododendrons, are best in masses or clumps, while others, chiefly notable for their beauty of form, are seen to most advantage if planted singly upon a lawn, or in other open ground. Where space is available, belts of shrubs may be established instead of hedges as a dividing line, and they can also be used as screens for tender-growing plants, and as backgrounds for groups or masses of flowering bulbs. Dwarf shrubs can be placed to some extent on rock gardens, but care is necessary in the choice of subjects, otherwise the soil will become denuded of nourishment.

Shrub (Arab. *sharab*, beverage). Cordial compounded of currant juice, sugar, and water, with added spirit, usually rum. One form of this liquor is made of orange and lemon juice, peel, sugar, rum, and water, generally hot.

Shrubb, ALFRED (b. 1878). English long-distance runner. Born at Slinfold, Sussex, Dec. 12, 1878,



Alfred Shrubb, English long-distance runner

he joined the Horsham Blue Star Harriers in 1898, and carried off three Sussex championships: the mile, three miles, and four miles. His later successes included the southern counties cross-country championship, 1901 to 1904; the international cross-country, 1903 and 1904; and the national corresponding event, 1901-04. Shrubb held records, both amateur and professional, for distances from 2 to 25 m., including world records from 8 to 11 m. Over 15 m. he defeated Longboat, St. Yves, Dorando, and Hayes. He wrote on long distance running and training. *See Running*.

Shumen (Turk. Shumla). Town of Bulgaria, capital of the county of the same name. Strategically important as a rly. and road centre, it is about 55 m. W. of Varna, and stands on a plain at the foot of the N.E. Balkans. It is a chief military post, has woollen, cotton, and leather industries, and exports cloth, wine, and copper. It was attacked by the Russians without success in 1774, 1810, and 1828, but they occupied it in 1878 on its evacuation by the Turks after the Russo-Turkish War. Pop. 25,486. Co., area, 5,690 sq. m.; pop., 1,020,499.

Shunt. In electricity, an alternative circuit connected in parallel with an instrument or another circuit, so as to form an alternative path for the current. (A Short Circuit, *q.v.*, may be regarded as a shunt of negligible resistance.) A low resistance shunt is connected across delicate measuring instruments such as a D.C. ammeter, where it is impracticable to wind the instrument to take more than a small proportion of the current; since the drop across the resistance of the shunt varies directly with the current, the instrument can nevertheless measure the total current passing. In generators and motors, shunt-wound means that the field windings are connected directly across the armature, as opposed to series windings. *See Dynamo*.

Shuntienfu. Name given by the Mongols to the city now called Peking, and so described in this work. It has also been known as Yenking and Peiping.

Shushan (Heb., lily). Biblical name for the ancient city of Susa, in Elam, the winter residence of the Persian kings (Neh. 1; Esther 1, v. 4; 8, v. 9; Dan. 8; Ezra 4). Its ruins are about 30 m. W. of Shushtar. *See Susa*.

Shushtar. Town of Persia. Situated on the Karun, in the prov. of Khuzistan, it has become increasingly important during the 20th century on account of the oil fields, worked by the Anglo-Iranian Oil Co. It lies about 170 m. W. of Ispahan, manufactures carpets, and exports wool, gums, and grain. The chief of many imposing edifices is the mosque, Masjid-i-Juma. During the First Great War, early in the Mesopotamian campaign, it was the scene of operations which resulted in its occupation. Pop. 12,000.

Shutter. In photography, means whereby the amount of light permitted to affect the light-sensitive material is controlled. The simplest form of shutter is a cap fitted over the lens which can be removed and replaced. The shortest exposure which can be thus made is about one second. Most modern shutters have an adjustable pointer which can be set to either of the letters T, B, or I. T (time) means that one movement of the release opens the shutter and a second pressure is needed to close it. With B (bulb) the shutter remains open so long as pressure on the release is maintained. With I (instantaneous) a single pressure opens the shutter which closes again automatically.

after a pre-determined period. Most common is the between-lens type, which gives automatic speeds of from one or two secs. down to 1/500 sec. It has a series of very thin metal blades which overlap in the centre of the lens when closed. Its efficiency is dependent on the time during which it is fully open; it should spend as little time as possible on the actual operations of opening and closing. A delayed-action device is often incorporated in shutters, to allow an interval for the photographer to leave the camera and include himself in the picture before the shutter is released. *See Camera.*

Shuttle. Device used in weaving to carry the weft across the loom. It carries the weft in the form of a bobbin or cop, and when passed across the loom goes between the upper and lower lines of the warp, leaving behind it a thread of weft. The shuttle, made from hard wood, tapers at the ends, where there are metal tips, and has at one end an eye through which the weft passes. Shuttles vary in size and weight according to the type and width of the loom; a 45-in. linen loom uses a shuttle 13 ins. long and 1½ in. wide and weighing 10 oz. Before Kay's invention of the flying shuttle in 1733, the device was manually worked.

The term shuttle service describes road or rail transport to and from over short distances, usually operated by a single vehicle. When there is an obstruction on a rly. line, a shuttle service of road vehicles is organized to convey passengers from one side of the obstruction to the other.

Shuttleworth College. British educational establishment. Situated at Old Warden, Beds, and opened in 1946, it was founded by Mrs. D. C. Shuttleworth, in memory of her son, R. O. Shuttleworth, who was killed while flying during the Second Great War. She gave her house and estate of some 6,000 acres to be devoted to the training of boys in forestry, agriculture, and aviation. The home farm of 480 acres has its own pedigree herd of Guernsey cattle.

Shuya. Town of R.S.F.S.R. It is in the region of Ivanovo, and is situated 70 m. N.N.E. of Vladimir, on the river Teza, and 150 m. N.E. of Moscow, on the rly. from Vladimir to Ivanovo-Voznesensk. The chief occupations of the town are cotton-spinning, dyeing, and printing, the first being specially important. The population is estimated at 58,000.

Shwebo. Dist. and town of Burma, in the Sagaing division. The dist. includes much of the hill country between the Irawadi and the Chindwin valleys, and is bounded E. by the Irawadi. Rice is practically the only crop. The town is some distance W. of the Irawadi, on the rly. N. from Mandalay. Occupied by the Japanese in May, 1942, the town was the scene of violent fighting in Jan., 1945, when Indian troops of the 14th army broke in on the 7th, occupying the rly. station; the Japanese resisted until the 10th, when they withdrew, leaving the streets and houses mined and set with booby traps. Area, 5,714 sq. m. Pop., dist., 496,185; town, 14,000.

Shylock. Character in Shakespeare's *The Merchant of Venice* (q.v.). A Jewish moneylender, he takes advantage of the fact that Antonio, a Christian merchant, has forfeited a pound of his flesh through his failure to repay a loan

of 3,000 ducats within three months. Refusing the offer made by Bassanio, the friend for whom Antonio borrowed the money, to pay the sum threefold, Shylock presses his claim in court, but is baffled by Portia (q.v.). *See Irving, Sir H.; Jessica.*

Sialkot. District and town of Punjab, Pakistan, in the Lahore division. It occupies a portion of the Rechna doab, between the Ravi and the Chenab, and is irrigated by the Upper Chenab Canal. Wheat is the chief crop. The Jats are the chief tribesmen. The town is an important centre of trade, and manufactures paper, tents, and athletic appliances, though this trade was much dislocated by the migration of 1947. In the centre of the town is an ancient fort, built more than a thousand years ago, and gallantly defended during the Mutiny. Area (dist.), 1,576 sq. m. Pop., dist., 1,190,497; town, 138,348.

SIAM: LAND OF THE T'AI PEOPLE

Neville Whyman, Ph.D., Litt.D.

The history and geography of the country of S.E. Asia called by its inhabitants Muang T'ai, or land of free people, is here given, together with some particulars of its state of development

An ancient and modern kingdom of S.E. Asia, forming part of the Indo-Chinese peninsula and having



Siam arms

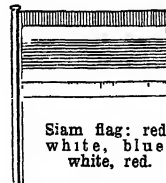
land boundaries on the W. with Burma, on the S. with Malaya, on the E. with the federation of Indo-China, Siam's native name is Muang T'ai, land of free people, sometimes translated as Thailand.

Siam lies entirely within the monsoon area. Its southern extremity is within 6° of the equator, its northern is 21° N. It lies between 98° and 105° E. of Greenwich. The rainy season is from May to Oct., corresponding with the prevalence of the S.W. monsoon in the Bay of Bengal. The influence of the bay on Siam is somewhat reduced by the range of hills on the country's W. border. Siam is a mixture of readily accessible and luxuriant plains and thick, impenetrable jungle, parts of which have never been explored. Its area is 200,148 sq. m. and its pop. (est.) was 15,718,000 in 1940. Primary education is free and, in theory, compulsory.

There are numerous streams in the country, of little use to any but small river craft. The one navigable river, the Menam, is deep and sluggish, except in the autumn

when swollen by the summer rains. It is affected by tides for 50 m. from its mouth.

The most is made of Siam's rivers by an elaborate system of canals, these waterways providing the chief transport in the interior. Expenses incurred in keeping the canals clear and the landing-stages in good order are covered by the collection of tolls (small in amount but, by virtue of the amount of traffic, more than adequate to meet all costs). There are about 2,000 m. of rlys., owned by the state. Normally the country is not only self-supporting, being mostly agricultural, but has a surplus for export; only in times of drought or other disaster is it



Siam flag: red, white, blue, white, red.

necessary to import rice and other foodstuffs from neighbouring countries.

There are very few towns of any size, most places being villages or small towns of from a few score to a thousand or so inhabitants. Industrialisation has made little headway; what industry there is lies about Bangkok and Chiang-mai. Saraburi, 108 m. N.E. of Bangkok, was chosen 1945 to replace it as capital. Siam's mining

assets have been grossly overestimated (probably because some of the "Malayan" tin mines, actually on Siamese territory, produced very well in their early years). The country has, however, fair deposits of most of the minerals most needed by the world's industry; e.g. it ranks fourth in the international production of tin. Lead, tungsten, and coal are also found; but the mines are far away in jungle country, transport costs are high, and the quality of their products is not such as to attract the foreign market at the price at which they are normally offered.

Dense forests, which cover a great part of the N. and centre of the country, provide valuable woods in quantity, and the waterways offer means of floating the logs to towns where they can be cut and stored. The N. and W. provs. are well supplied with teak, and ironwood and ebony are also plentiful. Altogether some 20 varieties of wood, suitable for high-grade furniture, building, etc., as well as for fine cabinet-making, are exported from or worked in Siam.

HISTORY. Siam has a long history of foreign relations and trade. For more than 2,000 yrs., according to Chinese records and Siamese tradition, there have been close relations between China and Siam. There is also evidence that relations of great amity were maintained with India, the E. Indian islands, and even with Japan as long as 15 centuries ago. Much of the factual history of Siam has foreign records as its only basis, for the accounts given in earlier works written in Siamese are legendary. Throughout its history, Siamese literature has been under the domination of Buddhism. This faith, especially in its earlier development, relied much on oral tradition among the people, and the stories received accretions as they passed from mouth to mouth. Thus in the early records one finds miraculous stories of speaking animals carrying warnings to erring rulers, the appearance of strange omens in normal surroundings, as well as the attribution of human characteristics to beasts of the jungle. Some animals even became judges and passed verdicts on men and gods. Siam possesses some of the very earliest texts of the Buddhist canon, as well as some of the oldest commentaries on the sayings of the Buddha.

Until the sixth century A.D. the country was occupied by a group of T'ai-speaking peoples who kept themselves more or less separate

in isolated communities on either side of the mountain ranges. The unifying force was Buddhism and the gradual infiltration of Chinese culture from the N. rather than any local political or economic circumstance.

By about 1000 A.D. the fusion of tribes was well established and a Siamese script and language were in common use. Incursions from the N. and E. (particularly that of Kublai Khan in the 13th century) showed the necessity for a common front against outside foes. The Siamese T'ai swept southward, setting up capital cities ever nearer the southern extremity of the country.

The city famous in Siamese history and legend is Ayuthia. This city was founded in 1350 on the spot where a former capital (Sano) had been reduced to flames in battle. The fabulous wealth and luxury of this city, and of the court which reigned there, drew envious eyes from across the border. Several attempts were made by Burma and Pegu (then powerful, independent kingdoms) to conquer Siam, which by the 15th century had reached out and covered the whole of the Malacca peninsula.

The Portuguese were active in Indonesian waters in the 16th century and some of their mercenaries joined the Siamese defenders in their efforts to expel the invaders. For a long time these combined efforts were successful, but in 1555 the city of Ayuthia was taken and the country made a dependency. The outstanding name in Siamese history at this time is that of the patriot Phra Narai who, within a few years had subdued Laos and Cambodia and invaded Pegu, which kingdom fell to his successors early in the 17th century. The 18th century brought civil war in Siam, and Burma took possession of her



Siam. Map of the south-east Asian kingdom and part of the Indo-Chinese peninsula

W. limits, invaded the N., and, by a concerted double advance, marched on Ayuthia and after besieging it for two years took it, and finished by subduing the whole country.

European contacts with Siam began with the arrival of the Portuguese in 1511. They were, however, supplanted in the next century by the Dutch, although Phra Narain had been constrained to send an embassy to Louis XIV somewhere about 1680. There is abundant evidence of contact between England and Siam in friendly letters exchanged, through merchants in the Indies, between James I and the king of Siam. The East India Company had a factory at Ayuthia in the middle of the 17th century, abandoned, after quarrels and massacres, in 1688. In 1824 the British govt. signed a treaty with the Dutch which gave the U.K. control over Siam in so far as trade and similar matters were concerned. In 1826 Captain Burney signed the first treaty of friendship and commerce with Siam; seven years later Siam

signed a similar treaty with the U.S.A. She signed a treaty with Japan in 1898, with Russia in 1899.

When the U.K. had incorporated Burma into the British Empire and France had acquired lower Cochin-China, Annam, and Tongking, Siam was relieved of the danger from her neighbours which had for centuries oppressed her. The early years of the 20th century brought numerous discussions between the Siamese and the French, until Siam yielded up her rights in Cambodia and Laos; while agreements between the U.K. and France defined the position of Siam in Further India and her rôle in international affairs under the protection of France. A succession of treaties signed by the U.S.A., Japan, France, the Netherlands, Denmark, Spain, Portugal, Germany, and the U.K. confirmed these arrangements.

Internal Dissensions

After the First Great War internal troubles began to afflict Siam. Prajadhipok, who succeeded to the throne in Nov., 1925, found an uneasy situation, owing largely to increasing national consciousness among a people who had never previously thought of questioning the absolute monarchy under which they had lived. In June, 1932, a small middle-class group, part civilian and part military, began the first of a series of revolutions designed to set up a system of constitutional monarchy on the western pattern. But the revolutionaries could not agree among themselves, and many abortive risings followed. After ten years of near anarchy Prajadhipok (d. 1941) abdicated Mar. 2, 1935. At this time the split between civilian and military authorities was complete, and the deadlock was still unbroken when the Second Great War started.

During the late 1930s Japan had flooded Siam with agents, ostensibly on trade missions, but in fact emissaries of Japanese military intelligence. The Siamese began to deprive foreigners of their pre-eminence in trade, and raised anew the questions of Siamese sovereignty over territories which had, by treaty, been yielded to France. Japan was already exerting pressure on Indo-China, where her "tourists" were busy spreading the Asia for the Asiatics doctrine, and she brought all her influence to bear on the side of the Siamese. Border incidents won back part of Cambodia, including the towns of Battambang and

Sisophon, and Laos W. of the Mekong, confirmed to Siam by the Vichy govt. in Indo-China May 5, 1941, after "mediation" by the Japanese, whose influence in Siam grew steadily.

When on Dec. 8, 1941, Japanese forces landed in S. Siam and crossed the frontier near Battambang from Indo-China, Siamese troops resisted for only 5½ hrs., the govt. then giving permission for the passage of Japanese troops to Malaya. The Japanese occupied Bangkok the same evening. The first Allied air raid on Raheng on Jan. 3, 1942, was followed at intervals by others, Bangkok, Chiang-mai, and the Burma-Siam rly. (q.v.) being particular objects of attack. Siam declared war on the U.K. and the U.S.A. on Jan. 25, 1942, but took no active part in hostilities beyond annexing, with Japanese connivance, Kentung and Mong Pan, two of the Shan states in Burma, and the Malay states of Kelantan, Kedah, Trengganu, and Perlis. A broadcast from Bangkok on Aug. 16, 1945, announced that Siam had withdrawn her declaration of war against the U.K. and the U.S.A. and was prepared to hand back to the U.K. the annexed territories.

A peace treaty between the U.K. and India on the one hand, and Siam on the other, was signed at Singapore on Jan. 1, 1946. Diplomatic relations with the U.S.A. were restored on Jan. 5. Agreement with France was effected on

Oct. 15, 1946, when the Siamese national assembly agreed to the return to Indo-China of the areas ceded by the Vichy govt. in 1941.

CONSTITUTION. Siam is a monarchy, until 1932 absolute. The constitution set up in 1932 was superseded by a new constitution in 1946 under which the king as head of the nation exercised legislative power through a representative assembly, half the members of which were nominated by the king, half elected for four years by men and women over 20. A state council of 14 to 24 appointed by the king, 14 of whom plus the president were chosen from the assembly, exercises executive power. Siam is divided for administrative purposes into 70 provs. (*changwads*) with local legislative and executive bodies having limited powers.

The 20-year old King Ananda Mahidol was found dead from a gunshot wound on June 9, 1946, and was succeeded by his brother Phumibol Aduldet, then 18 years of age. The commission set up to inquire into Ananda Mahidol's death decided by a majority vote that murder was the most likely explanation. Renewed efforts on the part of malcontents to seize power gave the military leader who had collaborated with the Japanese during the war years, Marshal Luang Pibul Songgram, the chance to engineer, Nov. 9, 1947, a *coup d'état* which made him virtual dictator.

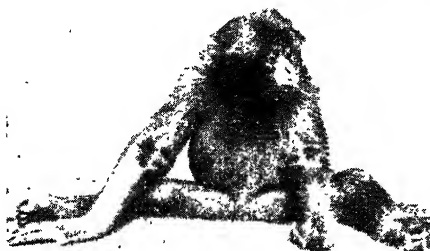
Bibliography. Journal du Voyage de Siam, L'Abbé de Choisy, 1741; The Kingdom of Siam, A. C. Carter, 1904; Siam, W. A. Graham, 1924; History of Siam, W. A. R. Wood, 1926; Siamese State Ceremonies: their History and Function, H. G. Q. Wales, 1932; Siam in Transition, 1932-37, K. P. Landon, 1940; Siam: Past and Future, J. Crosby, 1945.

Siam, GULF OF. Wide and deep indentation of S.E. Asia. Across the mouth between Cambodia and the Malay peninsula it measures 240 m.; the Menam river delta in Siam is 470 m. N. of the mouth.

Siamang (*Hylobates syndactylus*). Gibbon or long-armed ape, native of Sumatra and the Malay archipelago. The siamang is the largest species of the genus, and is distinguished from its congeners by the middle and index toes being united by the skin for half their length. It stands about 3 ft. high, and is of a uniformly black colour, save for a few scattered grey hairs on cheek and chin. The ears are almost hidden by the thick growth of long fur; and on the neck there



Siam. A well-to-do Siamese man



Siambang. Ape notable for the length of its hind limbs
W. S. Berridge, F.Z.S.

is a large sac which is inflated when the siamangs indulge in their concerted howling. See Gibbon.

Siamese Twins. Name given to twins joined at birth. Chang and Eng (1811-74) were born of Chinese parents in Siam, and, their breastbones being united by a band of flesh, were sold by their parents and were exhibited in England and America. They died Jan. 17, 1874, one surviving the other by 2½ hours and then dying from shock.

These original twins were succeeded by Rosa and Josepha Blazek, born in 1878 in Skerychov, Bohemia. They lived in Czechoslovakia, but toured Europe in 1921, visited the U.S.A., where they contracted jaundice, and died in Chicago, March 30, 1922. The occurrence of "Siamese twins" is not infrequent; many are separated surgically at an early age.

Sian, HSIAN, OR SI-NGAN. Capital of Shensi prov., China. It was the capital of China under the Chou dynasty, about 1100 B.C. In 190 B.C. the name was changed to Changan. It was again made the capital of China in A.D. 589. Sian contains a mosque, among many fine old buildings, and here is set up the Nestorian tablet, which was dug up within 30 m. of the city in 1625. The inscription states that the stone was set up on Feb. 4, 781, and it is surmised that it was buried in 845 at the time of the persecution of the Nestorians. In 1900, during the Boxer rebellion, the Peking court withdrew to Sian. The city, which is walled and has an est. pop. of more than a million, is a great depot for trade. The Peilin or Forest of Tablets is a celebrated museum.

Siang. River of China. Rising in the N. of Kwangsi prov., it flows N.E. and N. through Hunan. It enters the Tungting Lake, and its length is 550 m.

Siangtan. Town of Hunan prov., China. It extends three miles along the Siang river, 30 m. above Changsha. Pop. 317,115.

Siauliai OR SHAULI. Town of Lithuanian S.S.R., centre of the country's road and rly. communications, 80 m. N.N.W. of Kaunas. Its chief manufactures are flour, spirits, and tobacco. In German occupation from soon after the invasion of Russia in 1941, Siauliai was liberated July 27, 1944. The German armies in Estonia and

Latvia were thus virtually cut off from Germany. Pop. 31,299.



Siamese Twins. Chang and Eng at the age of 18
From a print of 1829

Sibawaihi OR SIBUYA (c. 753-793). Arabic scholar. A Persian by birth, after studying at Basra he went to Baghdad, where he gained notoriety in a spirited dispute with the grammarian Kisai. Returning to Persia, he settled at Shiraz, where he died. He is famous for his Kitab (book), or Arabic Grammar.

Sibbald, SIR ROBERT (1641-1722). Scottish scientist, born in Edinburgh, April 15, 1641. After studying at Leyden and Angers, he settled as a physician in his native city, where in 1667 he planted a medicinal herb garden which later became the botanic gardens. President of the Royal College of Physicians of Edinburgh in 1684, the following year he was appointed royal physician and geographer of Scotland, being professor of medicine at the university. He died in Aug., 1722.

Sibelius, JEAN JULIUS CHRISTIAN (b. 1865). Finnish composer From Tavastehus, where he was

born Dec. 8, 1865, he went to study law at the university of Helsinki, but transferred in 1886 to the conservatoire, continuing his musical education in Berlin and Vienna. Returning in 1893 to teach composition and violin playing at Helsinki, he gained such eminence as a national musician that in 1897 a state pension set him free to devote his life to composition. He paid frequent visits to England and the U.S.A.



Jean Sibelius,
Finnish composer

Of all 20th century writers for full orchestra, Sibelius is most widely accepted as carrying on the great classical tradition. His work suggests vast intellectual resources, but its austerity is warmed by an imagination set going chiefly by thoughts on Finnish history and the national epic, Kalevala. Of his symphonies, No. 1 in E minor is most accessible; No. 5 in E flat most attractive; No. 4 in A minor is regarded as his highest conception but remote and fragmentary themes make it unloved; the last, No. 7 in C, is compressed into a single movement. With these may be ranked the violin concerto. Symphonic poems include Tapiola, a picture of northern forests, and such legends as The Swan of Tuonela, The Return of Lemminkainen, and Pohjola's Daughter. Characteristic methods are the scurry of strings, and the projection upon a sustained background of brass or woodwind in some unrelated key, but Sibelius must not be disregarded as a melodist, as the early, popular Finlandia and Valse Triste prove. He contributed to chamber music the string quartet, Voices Intimate, and wrote over 100 songs. The best study in English is by Cecil Gray, 1931.

Sibenik (Ital. Sebenico). Town of Yugoslavia, in Dalmatia. It is situated 31 m. N.W. of Split on the Adriatic Sea at the mouth of the Kerka, and contains a 15th-16th century cathedral, partly Gothic, partly Renaissance. It is connected with Split by steamer and by rly., 57 m. Pop. 37,284.

Siberia (Russian Sibir). Name given to the vast area of N. Asia which was the first part of that continent to be acquired by Russia. Covering over 4 000,000 sq m., it

lies between 46° and 78° 25' lat. N., and 55° long. E. and 170° long. W. It is bordered N. by the Arctic Ocean; E. by the Bering Strait, the sea of Okhotsk, and the Pacific Ocean; S. by China and the Kirghiz S.S.R.; and W. it is divided from European Russia by the Ural mts. It is part of the R.S.F.S.R. and is divided into the Far Eastern region, the Yakutsk A.S.S.R., Buriat-Mongol A.S.S.R., Tuva autonomous region, and the W. Siberian and E. Siberian regions.

From the Arctic sea-board extending for several hundreds of miles inland is a broad tract of marshy barren tundra only a few feet above sea level, which is frozen for the greater part of the year. Then comes a virgin forest (*taiga*, jungle). Farther S. is the huge border-ridge fringing the N. slope of the great plateau of central Asia.

Some of the longest rivers in the world intersect this vast region. The Yenisei emerges from the high plateau of Mongolia and flows due N. into the Kara Sea, a wide inlet of the Arctic Ocean, a distance of 2,950 m.; the Ob, which also enters the Arctic Ocean, at the great gulf of Ob, takes its rise in the Altai mts. 2,100 m. distant; the Lena rises in the Baikal mts. and empties into the Arctic Ocean after a course of 2,600 m.; and the Amur flowing into the Pacific Ocean, is the second largest river of Siberia, 2,920 m. from its source in Transbaikalia to its mouth in the Gulf of Tartary.

All these immense waterways are fed by big tributaries which are important rivers in themselves, e.g. the Angara 1,100 m., the Selenga 600 m., the Irtysh 252 m., and the Sungari, and constitute a vast network of rivers in every direction, the basin of the Yenisei alone being estimated to cover 1,950,000 sq. m. In addition to these four principal rivers, there are others of lesser magnitude, e.g. the Kolima, the Indigirka, and the Khatanga, which run into the Arctic Ocean, and the Anadir into the Pacific. On many of these rivers steamers ply during the summer months, but as their mouths and much of their courses are ice-bound for many months of the year their value to external trade and lumbering is limited. Siberia's principal lake, Baikal, is one of the largest freshwater lakes in the world.

As a result of its great distance from the sea and of its segrega-

tion by mt. barriers from the warmer influences to the S., central Siberia experiences the most extreme type of continental climate. At Verkhoyansk, where 127° of frost in the air has been recorded, the monthly mean temp. on the average ranges from about -60° F. in Jan. to +60° F. in July. Even in the southern regions—in the same lat. as London—winter (Oct.-April) temps. frequently drop below 0° F. In such intense cold, rivers freeze solid and become highways for sledges. Rain falls chiefly in the summer months when the crops in the better watered parts of the steppes grow with extraordinary rapidity; corn sown in May is ready for harvesting early in Aug.

Varieties of Inhabitants

The peoples of Siberia are varied. Samoyedes and Ostiaks live in the N.; Voguls along the slopes of the Urals; Mongols, including Kalmucks and Buriats, along the S. border; and Tartars everywhere. Since the 18th cent. political and criminal prisoners have been transported from Russia to Siberia, and a large part of the pop. is Russian, composed of such exiles and descendants of such exiles. Total pop. is some 14,000,000. Among the principal towns are Novosibirsk, Tobolsk, Tomsk, Krasnoyarsk, Yeniseisk, Irkutsk, Yakutsk, Omsk, Chita, Blagoveshchensk, Khabarovsk, and Vladivostok. Even before the revolution of 1917, in all these places municipal organization was becoming efficient, a system of primary education was developing. Collegiate schools and colleges had been opened in every town, while the university of Tomsk was famous throughout Russia. After the revolution administrative, educational, and industrial development was steadily encouraged.

The first rly. in Siberia, 479 m. long, running from Vladivostok to the Amur river, was opened in 1898. The Trans-Siberian rly. (q.v.), from Moscow to Vladivostok, was built between 1891 and 1905: this crossed Manchuria in the E. A new line, started in 1905 and completed during the First Great War, runs from Chita through Russian territory to meet the Vladivostok-Amur rly. at Khabarovsk. Another line, constructed since the 1917 revolution, leaves the old line at Omsk, runs S. of it through Barnaul and Stalinsk to Nijni Udinsk, and then N., following the valleys of the Lena and its trib. the Vilim for some way, to Port Soviet on the gulf

of Tartary. The Turksib rly. (q.v.) connects Siberia, at Barnaul, with Tashkent in Uzbek S.S.R.

Before the 1917 revolution trade was in the hands of a few rich merchants, and was carried on principally at the great annual fairs of Tomsk, Irkutsk, and Nijni-Udinsk. The Soviet govt. greatly developed production, the area under cultivation increasing from some 130,000 acres in 1915 to 790,000 acres in 1944. Agriculture is pushed even farther N.; flax and sugar beet have been grown in the tundra, and kok-sagyz, a central Asian plant cultivated during the Second Great War by the Russians for its rubber content, has been grown within the Arctic Circle. The forested areas continue to produce furs; and timber production has been stimulated, though the fact that the rivers, themselves frozen for long periods, drain into the Arctic Ocean limits lumbering possibilities. The Far Eastern region raises great quantities of soya beans, and has considerable fisheries. Silver and lead as well as coal are worked in Yakutsk A.S.S.R. Cattle breeding is the chief occupation in the Buriat-Mongol A.S.S.R., bee-keeping, poultry rearing, and fox farming being other industries. Eastern Siberia, especially in the Irkutsk region, is rich in coal, mica, and non-ferrous metals, but its chief products remain timber, furs, and gold. W. Siberia produces coal, grain, livestock, and timber. See Russia. Consult A Journey in Southern Siberia, J. Curtin, 1910; Through Siberia: The Land of the Future, F. Nansen, 1914; Conquest of the Arctic, L. Segal, 1939; Conquest of Siberia, Y. Semyonov, 1944; Soviet and Tsarist Siberia, G. Borodin, 1944.

Sibi. Town of Baluchistan, Pakistan. Important as a rly. junction, it lies in the valley of the Nari, near the entrance to the Bolan pass, and about 70 m. S.E. of Quetta. Occupied by the British during 1841-42, it was ceded to the U.K. by the treaty of Gandamak, 1879. It is famous for its horse fairs. Pop. 8,000.

Sibilant (Lat. *sibilar*, to hiss). Name given to letters that have a hissing or s-sound. The voiceless and voiced fricatives (s, sh, z, zh) and the consonantal diphthongs ch (as in church) and j (as in gem) are commonly known as sibilants.

Sibiu (Ger. Hermannstadt, Hung. Nagy-Szeben). Prov. and town of Transylvania, Rumania.

Before the First Great War the town lay in Hungary. It occupies a strategic situation on the R. Sibiu in a fertile valley near the N. end of the Rothen Turm pass through the Transylvanian Alps, and is an important rly. junction. Originally one of the main 12th century Saxon settlements in Transylvania, it contains a characteristic fortress church, and has stone houses connected underground. The chief building is the Brukenenthal palace; the town hall is of considerable antiquity. Its manufactures include cloth, candles, and soap. Pop. (1939) 50,247.

Sibyl (Gr. *Sibylla*). In classical legend, the designation of a number of prophetesses, inspired by Apollo. Ten were enumerated by late writers. The Cumaean Sibyl directed Aeneas to his father in the under-world (Aen. 6). She also offered to sell Tarquin the Proud nine prophetic books, and on his refusal burnt three, and again three, finally selling him the remaining three for the original price of the whole. Oracles in Greek verse, now lost, believed by the Romans to be these books, were consulted when danger threatened Rome.

The extant Sibylline Oracles, some 4,000 Greek hexameters, mostly written 200 B.C.-A.D. 300, are Jewish and Christian predictions, partly Messianic. Revered in the Middle Ages, they are alluded to in *Dies Irae*. As pagan witnesses to Christ, the Sibyls were represented in art, notably by Michelangelo in the Sistine Chapel in the Vatican. See *Cumae*; *Delphi*; *Oracle. Consult also* The Sibylline Oracles, Eng. trans. M. S. Terry, 1890.

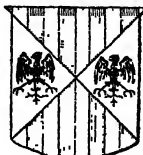
Siccative (Lat. *siccus*, dry). Preparation of oil mixed with painters' colours to cause them to dry quickly. The drying power of a siccative is hastened by boiling the oil in manufacture and adding sugar of lead, acetate of lead, white copperas, and certain other substances.

Siciliano. In music, a movement of quiet pastoral character found in some 18th century suites and sonatas, but more often used as a form of vocal music, especially by Handel. It was derived from a popular Sicilian dance-song. The time was generally 6-8.

Sicilian Vespers. Name given to the massacre of the French in Sicily on Easter Monday, March 30, 1282. The death in 1230 of the Hohenstaufen emperor, Frederick II, left Sicily at the mercy of many parties. For 16 years

the French attempted to curb the spirit of the islanders and divide their lands. At last the Sicilians broke into revolt as the bells of Palermo were sounding for vespers, and massacred nearly every Frenchman in the island. Verdi's overture with this title is often played.

Sicily. Largest island in the Mediterranean Sea, forming part of the republic of Italy. It has a triangular shape and lies just off the toe of Italy, from which it is separated by the Strait of Messina. The mountains are a S.W. continuation of the Apennines and lie



Sicily arms

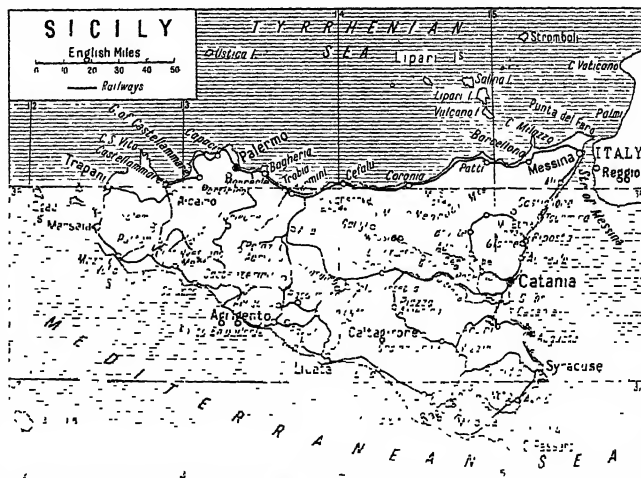
close to the N. coast, forming the Peloric Range (Monte Tre Fontane, 4,508 ft.) and Madonian Range (Pizzo dell' Antenna, 6,478 ft.). A ridge connects the central part of these mts. with the S.E. tablelands. Etna (10,755 ft.) is the highest point in the island.

The short, rapid rivers, the chief of which are the Simeto, Salso, and Platani, frequently dry up during the droughty summers, which are typically Mediterranean. The island is the world's second largest source of sulphur, while rock-salt and asphalt are also mined. Large quantities of salt are obtained through sea-water evaporation. Cereals are grown on the large estates, but fruit growing is the main occupation, lemons, oranges, olives, grapes, and almonds being the chief products. Tunny, sardines, coral, and sponges are the chief yield of the fisheries.

which provide extensive employment. With the neighbouring Lipari and Aegadian is. and islets, Sicily forms a region of Italy, with nine provs. It was granted some measure of autonomy in 1946. It has an area of 9,926 sq. m., and a pop. of 4,400,000. Palermo, the capital, Catania, and Messina are the chief ports. For an account of the Second Great War in Sicily, see *Italy: Campaign in, 1943-45*. The island, owing to the rapidity of its conquest, suffered comparatively little damage, no great treasures of art or architecture being lost.

Sicily has the most varied history of any portion of Europe. Little is known of its prehistoric inhabitants, who were of Iberian origin. When the Phoenicians began to colonise the island, c. 1000 B.C., they found the E. portion of the island inhabited by the Siceli and parts of the N.W. by the Elymi, a race of unknown origin. The Greeks founded their first colony in 735 B.C., and in the next few years Syracuse, Messina, and other considerable colonies were planted. Greek civilization spread throughout the island, and by 450 B.C. the greater number of the temples and monuments which now constitute some of the most famous ruins in the world had been built. A long series of wars with Carthage impelled the Greek inhabitants to invoke Roman aid, but after the expulsion of the Carthaginians the Romans remained, Sicily becoming a Roman province in 210 B.C.

Under the rule of the Romans the prosperity of the island declined. The Servile Wars (q.v.) and



Sicily Map of this historical Mediterranean island off the south of Italy

civil wars devastated the country, making it defenceless against the attacks of the Franks, who sacked Syracuse, A.D. 278. In 440 Gaiseric conquered the island, and it was ruled by the Goths until Belisarius conquered it in 535, when Sicily became part of the Eastern Empire. Soon afterwards the Saracens began their attacks along the Sicilian coast, and in 878 Syracuse fell to them. The greater part of the island later shared this fate, and became a seat of Arab culture.

The Normans in Sicily

In 1061 the Normans appeared under Robert Guiscard and Roger, sons of Tancred, and began the conquest of the island, which was completed 30 years later. Among the kings of one of the most thoroughly Normanised states in Europe were Roger II (d. 1154), whose victorious fleets defeated the Arabs and planted a colony on the shores of Greece, and William the Good (d. 1189).

On William's death a dispute arose about the succession, and the throne was eventually seized by Henry VI of Germany, son of Frederick Barbarossa. Henry died in 1197 and was succeeded by his son, the Emperor Frederick II, but after the defeat of Frederick's grandson Conradin in 1268 the Sicilian throne passed to Charles of Anjou. The Angevin rule was short-lived, for the massacre called the Sicilian Vespers (v.s.), 1282, slew or drove from the shores of Sicily every foreigner. The island then appealed to Spain for protection against further aggression; Peter of Aragon was crowned king in Palermo, and Sicily became little more than a Spanish possession. In 1718 it was reabsorbed in the kingdom of the Two Sicilies.

KINGDOM OF THE TWO SICILIES. This Italian state, which included Naples and Sicily, first came into existence during the 12th century, and after prolonged periods of dissolution and restoration, finally disappeared in 1861. It was a union of two dominions, that part of Italy lying S. of the Papal States, and the island of Sicily. In the second half of the 11th century the Norman adventurers, Robert Guiscard and his brother Roger, carved for themselves dominions in these regions. Robert became duke of Apulia, and Roger count of Sicily, and the history of the kingdom is thenceforward, until the expulsion of the Angevin dynasty, that of Sicily.

The Aragonese dynasty was established in Sicily in 1282, while the Angevin dynasty maintained

its separate rule in Naples. At the end of the 15th century Naples became a bone of contention between the house of Aragon and the French kings as representing the house of Anjou. In 1504 the French were finally driven out and the Two Sicilies again united.

For another two hundred years the Sicilies remained under the crown of Spain, though they formed a separate kingdom. On the partition of the Spanish dominions at the treaty of Utrecht (1713), the kingdom of Naples was transferred to Austria, and that of Sicily to the duke of Savoy, who later exchanged it for Sardinia; but after the war of the Polish succession (1733-1738) Austria gave up the kingdom of the Two Sicilies to Don Carlos, younger son of Philip V, king of Spain. A Bourbon dynasty was thus established at Naples, ruling over the Two Sicilies. During the Napoleonic wars Ferdinand IV was temporarily ejected from Naples, though not from Sicily; but on the fall of Napoleon, whose general Murat had been made king of Naples, Ferdinand was restored as Ferdinand I, king of the Two Sicilies. In 1860 Garibaldi came to the aid of malcontents, started a movement which swept the Bourbons out of Sicily, invaded the kingdom of Naples, expelled Francis II, and then laid down the dictatorship he had assumed in order that the kingdom of the Two Sicilies might form a part of the kingdom of Italy, to which it was joined in 1861. See Etna; Garibaldi; Italy; Messina; Naples.

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Sicinius Dentatus, LUCIUS. Hero of the ancient Roman republic. Tribune in 454 B.C., he was called the Roman Achilles on account of his prowess as a soldier. He was said to have fought in 120 battles and to have been wounded 45 times. He is not to be confused with Lucius Sicinius Bellutus, leader of the people in the first secession to the Sacred Mount in 494 B.C., and one of the first tribunes, who appears as a character in Shakespeare's *Coriolanus*.

Sickert, WALTER RICHARD (1860-1942). British painter.

Born in Munich of Danish descent, he was educated at Bayswater and King's College, London. He



Walter Sickert,
British artist

also studied at the Slade school and at Heatherley's, becoming later an assistant to Whistler, who with Degas was the main formative influence upon his art. This showed careful preparation before painting and preoccupation with light and tone. Among well-known paintings by Sickert were *Mamma Mia Poareta*, a portrait-study of an old Venetian woman, *The Raising of Lazarus*, *The Area Steps*, and *Ennui*. He found peculiar inspiration in the architecture and atmosphere of old music halls, and also painted many Victorian domestic scenes, both indoors and out, many of which in his later years he reconstructed from photographs and prints. He became president of the R.B.A. in 1928, but soon resigned. R.A. in 1934, he resigned the following year in protest against the "in-action" of the Academy over the decision of the S. Rhodesian govt. to destroy the Epstein statues on their building in the Strand. Sickert died Jan. 22, 1942. His third wife, Thérèse Lessore, who died Dec. 10, 1945, was also a painter of distinction. *Consult* Lives, R. Emmons, 1941; L. Browne, 1944; *A Free House*, ed. Sir O. Sitwell, 1947.

Sickingen, FRANZ VON (1481-1523). German knight. Born at the castle of Ebernburg near Kreuznach, March 2, 1481, he fought in the Venetian war in 1508. A champion of the Lutheran cause, in 1522 he raised the nobility of the Rhineland against the archbishop of Treves, and unsuccessfully laid siege to that city. In turn he was besieged in his castle of Landstuhl, where he died May 7, 1523.

Sickle. Hand implement, also called a reaping hook. It is used for cutting corn, and now mostly



Sickle employed in agriculture



Mrs. Siddons. This portrait of the celebrated British actress is from Sir Joshua Reynolds's painting representing her as The Tragic Muse

Pop. approx. 71,000. See Chislehurst.

Siddal, ELIZABETH ELEANOR (1834-62). Wife of Dante Gabriel Rossetti, whom she married May 23, 1860. This beautiful auburn-haired woman was the model for many paintings by the Pre-Raphaelite Brotherhood, the best-known being Millais's *Ophelia*. Daughter of a Sheffield cutler, she worked for a time as a milliner's assistant. At the time of her marriage she was far advanced in consumption, but her death on Feb. 11, 1862, was due to an overdose of laudanum, taken for neuralgia. See portrait under Rossetti, D. G.

Siddons, SARAH (1755-1831). British actress. Born at Brecon, July 5, 1755, daughter of Roger Kemble, an actor-manager, she was given a good education, and in 1773 married William Siddons, a member of her father's company. She made her debut at Drury Lane as Portia, Dec. 29, 1775, but achieved no success, though helped by Garrick, until during 1776-77 when she played in popular tragedies in Manchester. After achieving further triumphs at Bath and Bristol, she returned to Drury Lane, Oct. 10, 1782, as Isabella in Garrick's version of Southerne's *The Fatal Marriage*. For 30 years thereafter she remained the unrivalled queen of tragedy on the British stage, acting frequently with her brother, John Philip Kemble. She made a farewell appearance, June 29, 1812, at Covent Garden, as Lady Macbeth, but

reappeared frequently in benefit and charity performances. She died June 8, 1831, and was buried in the churchyard of S. Mary's, Paddington Green; there is a statue on the green itself.

The favourite equally of critics and ordinary playgoers, Mrs. Siddons probably carried her audiences into greater transports of enthusiasm than any other actress. She was admired not only for histrionic ability but also for a statuesque beauty. She was praised for domestic virtues and devotion to family interests. All the masters of portraiture delighted in painting her, and Reynolds's *The Tragic Muse* inspired a statue by Chantrey in Westminster Abbey.

Bibliography. Life, T. Campbell, 1834; The Kembles, P. Fitzgerald, 1871; Memoirs, J. Boaden, new ed. 1893; The Incomparable Siddons, Mrs. C. Parsons, 1909; Private Life, N. Royde-Smith, 1933; Mrs. S., Tragic Actress, Y. Ffrench, 1936.

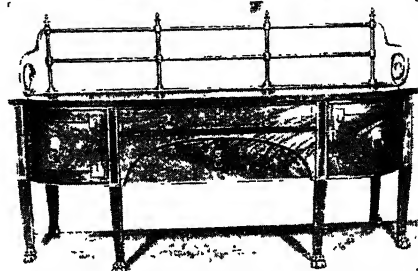
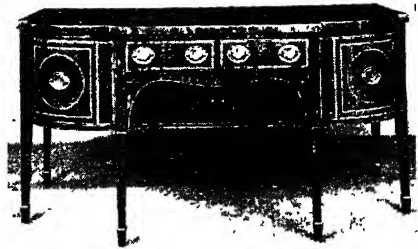
Side Arms. Military term to describe the serviceman's bayonet attached to a frog and suspended from the left of the belt.

Sideboard. In the Middle Ages, a board resting on trestles against the wall, as distinct from the board on trestles on which meals were served. The sideboard was used for the disposal of plates and dishes. At the beginning of the 16th century the buffet or side-table was evolved, and towards the end of the Tudor period the three-tiered buffet or sideboard

superseded by the reaping machine. It consists of a sharply curved blade attached to a short wooden handle, with either a smooth or a saw edge. The hammer and sickle, being symbolical of manual labour, make up the badge of Communism. See Agriculture; Reaping.

Sicyon. City of ancient Greece. It was in the N.E. Peloponnese, between Corinthia and Achaea on the R. Asopus about 2 m. from the sea. It first came into prominence in the 7th and 6th centuries B.C. under the rule of the Orthagoridae, a dynasty of enlightened tyrants, when it became famous for its pottery, wood carving, and bronze work. It was in Sicyon that classical Greek painting originated. In the 4th century its school of painting became famous under Eupompus, while in sculpture it was represented by the great name of Lysippus. After a renewal of prosperity under the guidance of Aratus (c. 250 B.C.) it lapsed into insignificance. During recent times its theatre was excavated.

Sidcup. A locality of Kent, England. It is 12 m. S.E. of London, and has rly. stations. The chief building is S. John's church, with a fine carved oak pulpit. The place, chiefly a residential district for Londoners, is part of the urban dist. of Chislehurst and Sidcup.



Sideboard. A Regency mahogany sideboard (c. 1810) with original brass rail at back; square legs terminate in lion paw feet. Top, Sheraton mahogany sideboard (c. 1785) on square tapered legs
Courtesy of M. Harris and Sons

came into being. These pieces are heavily constructed, the huge bulbous turnings having fully developed by that time. The surfaces are covered with carving in nailing, heraldic, and floral design, the flat surfaces of friezes being inlaid with holly and bog oak worked in the solid.

The sideboard later became less significant, and in the Chippendale period it was rather a side table. Robert Adam introduced pedestal sideboards in the 1760s; these were first carved and later painted.

In the Empire period the pedestal sideboard was once more fashionable; pieces were large, and of rosewood inlaid with brass. During the Victorian period sideboards were made in great diversity of style. From the early 20th century they have been small. Oak has been the favourite wood, often stained and polished, though pains are taken with the truly contemporary piece not to hide the figure of the wood.

Sidebone. Deformation of the feet of horses, particularly the fore-feet. It is due to a hardening of one of the lateral cartilages, through the deposition of lime salts therein. Permanent lameness may be the result. *See* Horse.

Sidereal Time (Lat. *sideræus*, relating to a star). Time as reckoned by the apparent diurnal motion of the stars. A sidereal clock which represents the rotation of the earth on its axis as referred to the stars, would complete 24 sidereal hours between the departure of any meridian from a star and its next return to it. The sidereal clock is one of the most important instruments in an observatory, enabling the right ascension of any object crossing the meridian to be at once stated. The sidereal day is reckoned from the passage over the meridian of the first point in Aries. *See* Calendar.

Siderite. In mineralogy, iron carbonate, FeCO_3 , containing up to 43 p.c. iron, often impure. It is sometimes called chalybite or spathose iron and occurs as rhombohedral crystals with curved faces, also massive and granular; the colour is generally buff. Clay ironstone is an impure iron carbonate found as nodules and bands especially in the coal measures of many countries; these constitute valuable iron ores. Blackband ironstone is a carbonaceous type of clay ironstone. Siderite is formed as precipitates in lakes, etc.; as sedimentary deposits; as metasomatic deposits in limestone; and in mineral

veins. The famous minette ores of Alsace-Lorraine contain siderite, as do the Mesozoic ores of the English Midlands.

Siderostat. Device for reflecting by an automatically moving mirror the rays of light received from a star along the axis of a fixed telescope. In its main features it consists of a plane mirror moved by clockwork to keep pace with the heavenly body under observation. *See* Telescope.

Sidesman. In the Church of England, an official appointed by the parochial church meeting and the incumbent to help the churchwardens in various ways, e.g. taking the offertory.

Sidgwick, ALFRED (1850–1943). British philosopher. Born at Skipton, and a product of Rugby and Lincoln College, Oxford, he was a first cousin of Henry Sidgwick (v.i.). A fellow of Victoria University, Manchester, he was an original logician and became known for his philosophical books, which included *Fallacies*, 1883; *The Process of Argument*, 1893; *The Application of Logic*, 1910; and *Elementary Logic*, 1914. He died Dec. 22, 1943.

His wife, Cecily (1855–1934), was born in London of German parents whose surname was Ullman. She began to write after her marriage in 1883, and as Mrs. Alfred Sidgwick gained a wide public, her best books being about Germany and having Anglo-German settings. Novels of this type included *The Grasshoppers*, 1895; *The Severins*, 1909; *Anthea's Guest*, 1911. Set in the Cornish artists' colony where she herself lived was *None Go By*, 1923. Collaborating with Crosbie Garstin, she wrote *The Black Knight*, a romance based on the latter's adventures in Canada. She died August 10, 1934.

Sidgwick, HENRY (1838–1900). British philosopher. Born at Skipton, May 31, 1838, he went to Rugby and Trinity College, Cambridge, of which he became a fellow and lecturer, and in 1883 was appointed professor of moral philosophy. He died Oct. 28, 1900.

Sidgwick was recognized as the leading ethical philosopher of his day. In his system he endeavoured to combine intuitionism with utilitarianism. The object of

ethics was to determine what individual human beings ought, or what is right for them, to do, and the means of realizing this end. The highest good was the greatest happiness of the greatest possible number. His chief work was *Methods of Ethics*, 1874; he also wrote *Elements of Politics*, 1891.

Sidgwick married in 1876 Eleanor Mildred (1845–1936), sister of A. J. Balfour. She was principal of Newnham College, 1892–1910. She died Feb. 10, 1936.

His younger brother Arthur (1840–1920) went to Oxford in 1882 as fellow and tutor of Corpus, and from 1894 to 1910 was university reader in Greek. This well-known classical scholar died Sept. 25, 1920. Arthur's daughter Ethel (b. Dec. 20, 1877) was a novelist.

Sidi Barrani. Village of Egypt, situated on the Mediterranean coast, 60 m. E. of Bardia. On Sept. 13, 1940, Italian forces under Graziani (*q.v.*) invaded Egypt, occupying Sidi Barrani three days later. British and Free French forces retook the village on Dec. 11, during Gen. Wavell's advance into Cyrenaica. In June, 1942, the Germans and Italians under Rommel compelled the British 8th army to withdraw from the Gazala position, Sidi Barrani being lost on June 24. After the victory at Alamein it was recaptured from the Germans on Nov. 10. *See* North Africa Campaigns, 1940–43; Senussi.

Sidi-bel-Abbès. Town of Algeria. It is situated 35 m. S. of Oran. A centre of the French military organization of N. Africa, it trades in wines and cereals produced in the surrounding countryside. It is connected with the coast by rly. Pop. 65,500.

Sidi Omar. Military post on the Libyan-Egyptian border. Situated 30 m. S.W. of Sollum, it figured prominently in the Western Desert campaigns of the Second Great War, and was captured from the Italians by British forces on Dec. 16, 1940. Retaken by the Germans in Rommel's campaign the following spring, it was again occupied by British troops during the second advance into Libya, and provided the base for the armoured sweep across the desert to Tobruk. After Rommel's offensive in June, 1942, Sidi Omar was evacuated by British troops during the retreat into Egypt, but was recaptured Nov. 11 by the 8th army in their advance from Alamein. *See* North Africa Campaigns, 1940–43.



Henry Sidgwick,
British philosopher

Sidi Rezegh. Village of Libya, 10 m. S.E. of Tobruk. During the first British campaign in N. Africa, Sidi Rezegh was captured from the Italians, Jan. 6, 1941. German and Italian forces retook the place in April, only to lose it on Nov. 19, when the British 8th army attacked. Terrific and confused tank battles raged in the vicinity of Sidi Rezegh for several days, the place changing hands several times, but finally remaining in the possession of the British. On June 17, 1942, the 8th army withdrew, following the evacuation of the Gazala position. The village was recaptured on Nov. 12 during the final advance on Tobruk from Alamein. See North Africa Campaigns, 1940-43.

Sidky, ISMAIL, PASHA (1875-1950). Egyptian statesman. Born at Alexandria, he was educated at the collège des Frères, Cairo, and the Khedivial law school. Minister of agriculture, and later of religious institutions, 1914, next year he joined the Wafd (*q.v.*) and was deported with Zaghlul Pasha and others to Malta. On his return in 1919 he became an opponent of the Wafd. Prime minister, 1930-33, he then devoted himself chiefly to business. He helped in negotiating the Anglo-Egyptian treaty, 1936, and was again premier Feb.-Dec., 1946, when its revision was inaugurated. He died in Paris, July 9, 1950.

Sidlaw Hills. Range of hills in Scotland. It forms the S. boundary of Strathmore and extends N.E. from Kinnoull Hill in Perthshire to Stonehaven in Kincardineshire. The chief summits are Craighowl (1,493 ft.), Auchterhouse Hill (1,399 ft.), and Dunsinane (1,012 ft.), with traces of an ancient fort popularly called Macbeth's Castle.

Sidmouth. Watering-place, tourist centre, and urban dist. of

Devon, England. It stands on Lyme Bay, at the mouth of the Sid, 13 m. E.S.E. of Exeter and 168 m. from London, and is the terminus of a branch rly. line. The parish church of S. Nicholas, dating in part from the 13th century, has a window presented by Queen Victoria, in memory of her father, the duke of Kent, who died here. The duke's residence later became an hotel. Sidmouth has good bathing facilities, recreation grounds, and other attractions for visitors including a theatre and two cinemas. Pop. est. (1948) 10,000.

Sidmouth, HENRY ADDINGTON, VISCOUNT (1757-1844). British politician. Born May 30, 1757, in London, he



Viscount Sidmouth,
British politician
After G. Richmond

was educated at Cheam, Winchester, and Oxford, and entered parliament, 1784. He was elected Speaker, 1789, and was largely occupied for several years with the impeachment proceedings against Warren Hastings (*q.v.*). On Pitt's resignation in 1801, Addington resigned the Speakership and formed a ministry which negotiated the peace of Amiens, but only lasted until the opposition of Pitt and his colleagues forced his retirement in 1804. He was created Viscount Sidmouth, 1805, and entered politics again as Home secretary, 1812-21, when his administration earned him great unpopularity owing to the coercive measures he adopted in the Luddite riots, and other labour troubles. He retired from the cabinet in 1824, and died Feb. 15, 1844. *Consult* Life and Correspondence, G. Pellew (son-in-law), 1847.

Sidney, ALGERNON (1622-83). English politician. He was the second son of the second earl of Leicester, and a grand-nephew of Sir Philip Sidney, and was probably born at Penshurst. In 1632 and 1636 he accompanied his father on embassies to Denmark and France, and in 1642 he was captain in his

brother's regiment of horse against the Irish rebels. He joined the Parliamentary army, and was severely wounded at Marston Moor in 1644. He became governor of Chichester, 1645; M.P. for Cardiff, 1646; and in 1647 lieutenant-general of the horse in Ireland. During 1647-50 he was governor of Dover. Sidney was appointed one of the commissioners for the trial of Charles I, but absented himself, and did not sign the death warrant.



Algernon Sidney,
English politician

In 1652 he was appointed member of the council of state, but in the following year, resenting Cromwell's assumption of power, he retired to Penshurst, where he remained until 1659, when he again became a member of the council. At the Restoration he went abroad, but returned to England in 1677. In 1680 he began the writing of his chief work, *Discourses Concerning Government*. A strong republican and opponent of the Roman Catholics, he was one of the leaders marked down for destruction after the discovery of the Rye House Plot, was tried, and on trivial evidence sentenced to death. He was executed on Tower Hill, Dec. 7, 1683. His *Discourses Concerning Government* was published in 1698, and his *Works* in 1772. *Consult* Memoirs of Algernon Sidney, G. W. Meadley, 1813; *Life and Times of A. S. A. C. Ewald*, 1873.

Sidney, SIR PHILIP (1554-86). English soldier and poet. Born at Penshurst, Kent, Nov. 30, 1554, eldest son of Sir Henry Sidney and Mary Dudley, daughter of the duke of Northumberland, he was educated at Shrewsbury, Oxford, and Cambridge. In Paris he witnessed the marriage of Navarre and Marguerite de Valois, found safety with Walsingham in the English Embassy during the night of S. Bartholomew, and first met Hubert Languet, with whom he went to Poland. He also visited Frankfurt, Strasbourg, Vienna, Venice, Padua, Florence, Genoa, Prague, Dresden, and Heidelberg. On his return he was present at the Kenilworth Revels, and visited Chartley, where he met Penelope Devereux, the Stella of his Sonnets.

In 1577 he was Elizabeth's ambassador to the Emperor Rudolph II at Prague and to the counts Palatine, Louis and Casimir. William the Silent authorised him



Sidmouth, Devon. View overlooking the town from the north-east

to offer Elizabeth the sovereignty of Holland and Zealand, paid a glowing tribute to his abilities, and would have welcomed his marriage with a daughter of the House of Orange. Dismissed from court for opposing the Alençon marriage, Sidney was in 1581 elected M.P. for Kent. In 1583 he was knighted, made master of the horse, and married Frances Walsingham. In 1585 he was made joint master of ordnance, recalled from a secret attempt to join one of Drake's expeditions, and appointed governor of Flushing.

On Sept. 22, 1586, in a charge against the Spanish cavalry at Zutphen, he was shot above the left knee, but proudly rode off the field. On his way he passed a poor soldier who, in Fulke Greville's memorable phrase, "had eaten his last at the same feast," and was casting up his eyes at the bottle brought to assuage Sidney's thirst. Sir Philip "took it from his head before he drank and delivered it to the man with these words, 'Thy necessity is yet greater than mine.' And when he had pledged this poor soldier he was carried to Arnheim," where he died, Oct. 17.

The states of Zealand applied for permission to inter his remains beneath a handsome monument at the expense of their government, but he was buried in S. Paul's cathedral, Feb. 16, 1587. As soldier and statesman Sidney fretted against Elizabeth's vacillating foreign policy, and won golden opinions from the Dutch. As a man he enjoyed the friendship of his most eminent contemporaries at home and abroad. As a writer, he composed all his works within about four years, and they were published after his death. His *Apologie for Poetrie* is the first example of English literary criticism; his pastoral romance, *The Arcadia*, written for his sister Mary, a foundation book in English prose romance, and an example of mental self-portraiture; his *Astrophel* and *Stella* sonnets gave the sonnet sequence its vogue in England. He translated the first two books of Aristotle's *Rhetoric*. See *Arcadia*; *Penshurst*; *Rich*, Penelope.

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Sidney Street Affair. Celebrated siege of criminals in Sidney Street, Commercial Road, London, E. Late on Dec. 16, 1910, the



Philip Sidney

tenant of the house next to 119, Houndsditch (occupied by a jeweller), heard strange scrapings and rappings at the back of his own premises. He gave the alarm and the attention of the police was turned upon three houses, 9, 10, and 11, Exchange Buildings, which backed upon the Houndsditch row. A police cordon was at once drawn round the buildings, and Sergeant Bentley knocked at No. 11. The door was opened by Gardstein, one of the criminals, and Bentley put his foot across the threshold. Almost immediately Bentley and Sergeant Tucker were shot dead.

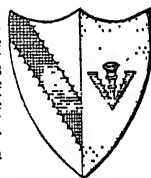
Afterwards Gardstein was accidentally wounded by his own friends, and was found dead in a house in Grove Street the following day, together with a number of papers which threw light on the other criminals. These included the ringleader Peter Straume (known as Peter the Painter), Fritz Svaars, and another man called "Joseph."

At midnight, Jan. 2, 1911, information was brought that the latter two had forced their way into the room of a woman at 100, Sidney Street, and had taken refuge there. At day-break the two fugitives were

called upon to surrender. The only answer was a fusillade, in which Inspector Leeson was mortally wounded. Winston Churchill, as Home secretary, at once gave instructions for an attack on the house, and visited the scene to watch developments. A detachment of Scots Guards was brought up, and began a process of progressive sniping at the windows and roof of the house. The building caught fire, and, later, charred remains, identified as those of Svaars and "Joseph," were found amongst the debris. Beyond these men no other participants in the earlier crime have ever been punished, and it has been averred that Peter the Painter escaped to Australia. Three firemen were injured.

Sidney Sussex. College of Cambridge university. Occupying the site of a Franciscan convent, it was founded in 1596 under the will of Lady Frances Sidney, widow of the 3rd earl of Sussex, by a charter granted in 1594 by Queen Elizabeth to Henry, earl of Kent, and Sir John Harrington, the executors. The statutes provided for a master, 10 fellows, and 20 scholars. The original buildings were largely reconstructed in 1821-32. The chapel, which dates from 1776, was redecorated in 1833, and enlarged in 1916-17. A new court was added in 1893.

Notable benefactors have included Peter Blundell, Sir Francis Clerke, and Sir John Brereton. The members have included Oliver Cromwell (though he never matriculated), Edward Montagu, 2nd earl of Manchester, Thomas May, historian of the Long Parliament, Roger L'Estrange, Thomas Fuller, and George Butler, headmaster of



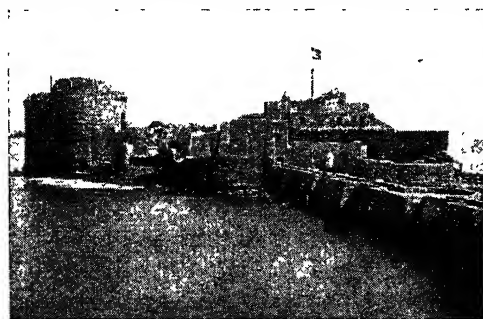
Sidney Sussex College arms



Sidney Sussex College, Cambridge. Quadrangle of the New Court, added to the college in 1890

Harrow. The present society consists of a master, 16 fellows, and 36 scholars.

Sidon. Ancient city of Phoenicia, now in Palestine. Situated on a cape, 25 m. S. of Beirut, it



Sidon, Syria. The Sea Castle, a 13th century fortress, protecting the bay and harbour

had a double harbour, and was celebrated for its purple dyes and glass manufactures. The first record of the city is c. 1400 B.C.; it was conquered by Sennacherib, 701 B.C., and, as the headquarters of the Phoenician navy, contributed the best ships to the expedition of Xerxes against Greece. It was destroyed by Artaxerxes III in 351 B.C. Under the Romans it was a free city. It became Mahomedan in 637, and frequently changed hands during the crusading epoch. Later it was for two centuries the port of Damascus. The tombs of the ancient city have yielded many sarcophagi, notably the so-called sarcophagus of Alexander now in Istanbul. The W. part of the old site is occupied by the modern town of Saïda, which exports olive oil, oranges, and lemons. It was captured by Australian troops on June 15, 1941, during the campaign against the Vichy French troops from Syria. Pop. est. 10,000. See Phoenicia.

Sidra. In Mahomedan lore, a tree of paradise, in the branches of which sat the angel Gabriel, and from which were made the Tables of the Law given to Moses on Sinai.

Sidra. Gulf of the N. coast of Africa. It forms the principal inlet of the Mediterranean on its S. side. It was known to the ancients as Syrtis Major.

Sieben Gebirge (Ger., seven mts.). Group of peaks in Germany. Seven conical hills of volcanic origin rise in picturesque fashion above the right bank of the Rhine almost opposite Bonn. The chief heights are Ölberg (1,522 ft.), Löwenburg, and Drachenfels.

Siedlce. Town of Poland. It is about 50 m. E. of Warsaw, on two rlys. It played a considerable part in Polish revolutionary history, being taken and retaken by the Russians in 1831. The neighbouring flat and swampy dist. is devoted to agriculture and cattle breeding. Spirits, glass, and leather goods have been manufactured here. It was captured by the Germans in 1915 and changed hands in the campaign between the Poles and Bolsheviks in 1920. The town was virtually

destroyed by German aircraft during the campaign of 1939. It lay in the German-occupied part of Poland after the Russo-German partition of the country and was turned by the Germans into a strongpoint covering Warsaw. Its liberation on July 31, 1944, by the Russians disorganized the whole German system of communications E. of Warsaw. Pop. est. 34,000. Pron. Syaydl-tse.

Siegbahn, KARL MANNE GEORG (b. 1886). Swedish physicist. Born in Örebro, Dec. 3, 1886, he was professor of physics at Lund, 1920-23, at Uppsala until 1937, then at Stockholm. He made advances in the study of X-ray spectroscopy and its influence on our knowledge of atomic structure. For this he was awarded the Nobel prize for physics, 1924, and the Rumford medal of the Royal Society, 1940.

Siegburg. Town of Germany, in the Land of North Rhine-Westphalia. It is 16 m. S.E. of Cologne and in 1945 came into the British zone of occupation. Its buildings include a church of the 13th century. The Benedictine abbey which stood here from the 16th century was damaged in the Second Great War. The industries include making pottery and mining of coal and stone. Pop. 25,000.

Siege (Fr. *siège*, seat). Military operation whereby a fortress or town is cut off from outside help with the object of compelling its surrender through starvation or attrition of the garrison. Until the introduction in the late 19th century of rifled artillery firing shells, the art of siege had altered little since the wars of antiquity. The chief weapon of the besieging army was starvation: it was seldom able

to compel capitulation by destruction of the fortifications.

Military engineers, notably Vauban (1633-1707), so developed siege warfare that they could estimate the number of days necessary to capture a given fortress. The usual procedure, after the defenders had been driven behind defence works, was to establish a trench for the installation of artillery. From this first parallel, zigzag trenches were worked forward and second and third parallels established, the last as close as possible to the enemy's works. Sapping and mining then began. All this work was called circumvallation, while the besiegers protected themselves from the attack of a relieving army by forming a system of field defences called the line of contravallation.

Conditions altered radically in the First Great War. Although the German investment of Belgian fortresses in 1914 followed the classic military pattern, many later so-called sieges were, in effect, major battles in which permanent fortifications formed part of a prolonged front. During the German siege of Verdun in 1916, the fortress had a garrison of 100,000 men while French armies totalling 400,000 men were fighting in front and to the flanks.

In the Second Great War a new factor was aerial bombardment. This allowed defences and local communications to be saturated, so compelling the besieged army to develop defence in depth. Whereas breaching the walls of a fortified place had previously resulted in surrender, now a besieged place had to be fought for street by street and house by house. A notable example was Stalingrad. With the increasing range of artillery and bombing aircraft, the siege is ceasing to be a separate military operation. Strategists are disinclined to besiege a town or fortress when it may be by-passed and then forced to surrender through starvation or obliteration at the victor's leisure.

Notable sieges in the world's history begin with Troy and include those of Syracuse (396 B.C.), Jerusalem (A.D. 70), Acre (1191), Calais (1347), Orléans (1428-29), Constantinople (1453), Haarlem (1572-73), Breda (1625), La Rochelle (1628), Magdeburg (1631), Londonderry (1689), Gibraltar (1731, 1779, 1782), Prague (1741-44), Quebec (1759), Saragossa (1808), Ciudad Rodrigo (1810), New Orleans (1814), Sevastopol (1854-55), Lucknow (1857), Delhi (1857),

Vicksburg (1862), Charleston (1863), Metz (1870), Strasbourg (1870), Paris (1870-71), Plevna (1877), Khartum (1884), Ladysmith (1899-1900), Mafeking (1899-1900), Port Arthur (1904), Adrianople (1912), Maubeuge (1914), Przemyśl (1915), Kut (1916), Madrid (1938-39), Calais (1940), Tobruk (1941), Sevastopol (1941-42), Corregidor (1942), Stalingrad (1942-43), Cassino (1944), St. Nazaire (1944-45), Budapest (1944-45), Berlin (1945). *See* Fortification.

Siegen. Tn. of N. Rhine-Westphalia, Germany, 40 m. E. of Cologne, and the centre of the only valuable iron ore fields in Germany. A road and rly. junction, the town has two churches, S. Martin and S. Nicolas, dating respectively from 1200 and 1220, and two palaces which were begun in 1224 and 1695. It was the birthplace of Rubens. Siegen belonged from 1255 to the Nassau dukes; fell in 1806 to the duchy of Berg established by Napoleon; and again in 1813 to the duke of Nassau-Orange who ceded it to Prussia in 1815. During the Second Great War Siegen was captured by the U.S. 1st army, April 3, 1945; here were found, stored for safety in a hillside, paintings by Rembrandt, Rubens, Holbein, Van Dyck, Renoir, and others; Beethoven MSS. from Bonn; and treasures from Cologne and Aachen (Aix-la-Chapelle) chapels, including the crown, sceptre, and gold cups of Charlemagne. F.-M. Model attempted unsuccessfully to fight his way through Siegen out of the Ruhr during its investment by the U.S. 9th and 1st armies, April, 1945. (*See* Ruhr.) After the surrender of Germany, Siegen lay in the British zone of occupation. Pop. (1950) 33,350.

Siegen, LUDWIG VON (1609-c. 1680). German artist, the reputed inventor of mezzotint. Born at Utrecht, of German parents, he became an officer in the service of the landgrave of Hesse. He is said to have discovered the mezzotint process in 1642, and communicated it to Prince Rupert, 1654, who after the Restoration introduced it into England. Several of Siegen's own mezzotint portraits are in the British Museum.

Siegfried or **SIGURD.** Hero of the most famous of Teutonic legends, which arose among the heathen Franks of the Rhine, spread through Germany and Scandinavia, and is alluded to in the English Beowulf. In the Volsunga Saga, Sigurd is son of Sig-

mund the Volsung. He slays the dragon Fafnir and his treacherous master the smith Regin, plights his troth with the Valkyrie, Brunhild, but afterwards wins for her Gunnar, whose sister, Gudrun, he marries. Brunhild avenges herself by inciting Gunnar's brother Guthorm to murder Sigurd, but slays herself on his funeral pyre.

In the Nibelungenlied Siegfried makes himself invulnerable by bathing in the dragon's blood, save for one spot, and wins the hoard of the Nibelungs and the hood of invisibility, by means of which he helps Gunther (Gunnar) to win Brunhild in Iceland. It is Kriemhild (Gudrun) who provokes the murder of Siegfried. *See* Brunhild; Nibelungenlied; Volsunga Saga; Wagner, R.

In *Der Ring des Nibelungen*, the sequence of four music-dramas by Wagner, Siegfried is the title of the third, which is in three acts. It was written between 1854 and 1871, and first produced at Baireuth, Aug. 17, 1876, under Richter. The first performance in England was at Her Majesty's, London, May 8, 1882, and in English by the Carl Rosa Opera co. at Manchester, 1901.

Siegfried Line. German defence zone of the Second Great War. Begun in 1938 as a counter to the French Maginot line (*q.v.*), it extended along the German frontier from a point 15 m. E. of Basel to Karlsruhe, thence W. to the Luxembourg border, thence along the Belgian and Dutch frontiers to a point where the Rhine enters the Netherlands. Built by the Todt labour organization, the main part of the line had steel and concrete fortifications nearly two miles in depth. All communications were underground, as were the main artillery emplacements, which were mounted in cupolas that could be raised for firing. Surmounting the line were 12,000 concrete forts mounting anti-tank artillery. In front of the main defences was an elaborate system of obstacles, giving the zone a depth of up to 30 m. Incomplete when Germany invaded France in 1940, it was neglected from 1943 in favour of the so-called west wall. On Sept. 12, 1944, the U.S. 1st army made a limited penetration of the line near Trier, and on Oct. 2 broke through near Geilenkirchen.

In the First Great War, when the Germans built fortifications in the rear of the Hindenburg Line, each zone had a Wagnerian name: there were Siegfried, Wotan, Brunhild, and Hunding lines.

Siemens, ALEXANDER (1847-1928). British engineer. Born at Hanover, Jan. 22, 1847, and educated at Hanover and Berlin, he entered the workshops of the firm of Siemens at Woolwich in 1867. The following year he assisted in building the Indo-European telegraph line, in 1869 the cable in the Black Sea, and other cables; as well as erecting regenerative gas furnaces in N. America. He was naturalised as a British subject, 1878, and was president of the Institution of Civil Engineers, 1910-11. He was responsible for lighting the British Museum and Albert Hall. He died Feb. 19, 1928.

Alexander Siemens,
British engineer



Siemens, ERNST WERNER VON (1816-92). German engineer. Born at Lenthe, Hanover, Dec. 13, 1816, a brother of Sir William Siemens, he was educated at Lübeck and Berlin. In 1841 he invented a process of electro-plating, but afterwards he specialised in the construction of telegraph lines, laying many of the earlier lines in Europe, and inventing many improvements in transmission. He was the first to use gutta-percha as an insulating material; suggested the unit of electrical resistance known by his name; and was a pioneer in Germany in developing electricity for commercial uses. He died Dec. 6, 1892.

Siemens, SIR WILLIAM (1823-83). British engineer and metallurgist. Born at Lenthe, Hanover, April 4, 1823, and educated at Magdeburg and Göttingen, Karl Wilhelm Siemens first visited England in 1843 with a new process of electro-plating invented by himself and his brother. Here he turned his attention to the regenerative steam engine, an ingenious but unsuccessful invention; a new type of water meter which was superior to any then in use;



E. W. von Siemens,
German engineer



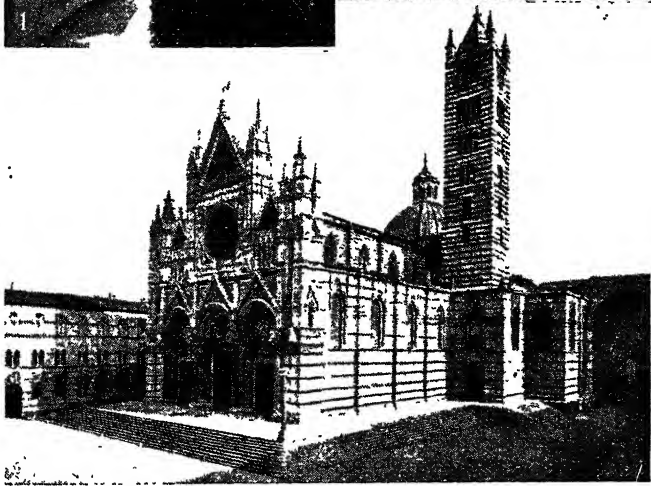
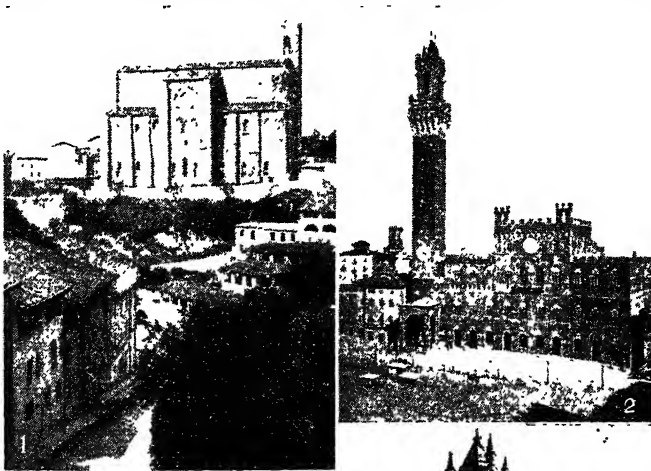
Sir William Siemens,
British engineer

and finally the regenerative furnace, an invention which made him world-famous, and was one of the landmarks in the progress of steel and iron manufacture.

In 1866 he established with his brothers electric works in England, and many important telegraph lines were laid under their direction, including the Atlantic cable in 1874, while the firm were largely concerned in the first applications of electricity to lighting and power. A man of remarkable inventive faculty, Siemens brought out many electrical devices, including an electric thermometer and electric furnace. He became a British subject, 1859, and was president of the British Association, 1882. He was knighted a few months before his death on Nov. 18, 1883. *See Iron; Regenerator; Steel; consult also Life, W. Pole, 1888.*

Siemens. German electrical engineering combine, formerly the largest of its kind in Europe. Founded by the four brothers Werner, William, Carl, and Friedrich Siemens, it branched into many fields and countries, comprising the firms of Siemens and Halske, Berlin; Siemens-Schuckert, Nuremberg; and originally Siemen's Bros., London. The Berlin branch, occupying a whole N.W. suburb of the city, known as Siemensstadt, and the subsidiary German firms employed 150,000 workers. The main plant was heavily damaged by Allied bombing in the Second Great War.

Siemens Process. Method of producing steel, suggested by Sir W. Siemens, in which his regenerative open hearth furnace is used. It is also termed the acid open hearth process. Pig iron and steel scrap, both of low sulphur and phosphorus contents, are introduced into the acid-lined furnace and melted. Elimination of the impurities, which begins during the melting stage, and continues after the charge has become molten, is by means of oxidation. The oxygen is supplied by the furnace atmosphere during the melting stage, and later by feeds of iron ore to the molten bath. The first impurities to be oxidised are silicon and manganese, which then help to form a slag on top of the molten metal. Subsequently carbon is oxidised to carbon monoxide. When the silicon, manganese, and carbon contents of the metal have been sufficiently reduced, the feeds of ore are stopped, and deoxidisers, usually ferro-silicon and ferromanganese, are added to remove



Siena, Italy. 1. Church of S. Domenico, from the south. 2. Palazzo Pubblico and Torre del Mangia, built in 1338-45. 3. The Cathedral, from the south, showing the fine triple portal and the 14th century campanile

excessive oxygen. The steel should then be ready for casting. Steel produced by this process is usually excellent, but good quality pig iron and scrap must be used for the charge because neither the sulphur nor the phosphorus content is reduced. The basic open hearth process, however, can utilise inferior pig and scrap. *See Open Hearth Furnace; Regenerator.*

Siena. Prov. of Italy in Tuscany. Hilly and scantily peopled, it is drained by the upper waters of the Ombrone and its tribs. and by the Elsa, a trib. of the Arno. Wheat, olive oil, Chianti wine, and silk are the principal products. Its area is 1,471 sq. m. Pop. 270,347.

Siena (Anc. *Sena Julia*). City of central Italy, capital of the prov. of the same name. It is 30 m. direct, but 60 m. by rly., S. of Florence, and is picturesquely situated on three undulating hills (c. 1,200 ft.). Surrounded by its

ancient walls, which embrace 2½ sq. m., the crooked, steep, and narrow streets assist in preserving its medieval aspect. On the principal square are many palaces, of which the most notable are the Palazzo Pubblico (1289-1305), with the fine slender tower, the del Mangia, and rich frescoes of the Sienese school, and the Palazzo del Governo (1469-1500), which houses the city archives and has also a library.

The Gothic cathedral, dating from 1243, overlooks the city; its façade of black, white, and red marble is profusely decorated; it contains Donatello's bronze statue of John the Baptist. Under the choir is the early 14th century church of San Giovanni; adjacent is the 15th century cathedral library. Its windows were smashed during the Second Great War. The university was founded in 1300. Straw plaiting and weaving

are industries; there is considerable trade in oil and wine.

A Roman colony in the time of Augustus, Siena was an important medieval city republic and a stronghold of the Ghibellines. In 1557 it was annexed to Florence. During the Second Great War it was entered by French troops of the Allied 5th army July 3, 1944. There was heavy fighting in the approaches to Siena, but the Germans, threatened on their left by the advancing 8th army, withdrew without fighting in the city which, however, they had mined. The plan of the mines was found and they were removed before they could explode. In consequence Siena suffered only minor damage. Pop. (1936) 48,664.

Sienkiewicz, HENRYK (1846-1916). Polish novelist. Born at Wola Okrzejska, in the prov. of



Henryk Sienkiewicz,
Polish novelist

Siedlce, Russian Poland, he was educated at Warsaw. His first work was a humorous story published in 1872, and called *No-body* is a Prophet in His Own Country; but he made his name by some letters which he contributed to the *Polish Gazette*, describing his experiences in California in 1876. In 1880 he brought out the historical novel, *The Tatar Bondage*, and later wrote a remarkable trilogy of tales—*Fire and Sword*, 1884; *The Deluge*, 1886; *Pan Michael*, 1887—describing 17th century society in Poland. This series was translated into English by J. Curtin, 1895-98.

In 1895 he published *Quo Vadis*, a romance of Nero's times, which, translated into some 30 languages, dramatised in England, France, Germany, and the U.S.A., and several times filmed, first in 1913 by Carl Laemmle, made him world-famous. Sienkiewicz received the Nobel prize for literature in 1905. His later works included *Knights of the Cross*, 1904, *On the Field of Glory*, 1906, and *In Life's Whirlpool*, 1910. He died Nov. 14, 1916. Pron. Syenk-yayvitch.

Sierra (Lat. *serra*, saw). Spanish name for a mountain chain or ridge whose edges are jagged or saw-like, e.g. Sierra Nevada in Spain, Sierra Madre in Mexico.

Sierra Leone. British colony and protectorate. The whole territory has an area of 27,940 sq. m. It lies between 6°55' and

10° N. lat. and 10°16' and 13°18' W. long. It is bounded N.W., N., and N.E. by French Guinea, S.E.



Sierra Leone
arms

by Liberia, S.W. by the Atlantic. It has a sea coast of 210 m. The colony proper consists of the Sierra Leone pen., about 28 m. long and 9 m. broad, and formed by a mt. ridge running parallel with the sea; Tasso I., lying N.E. of Freetown, Banana I., Bonthe on Sherbro I., and York I., to the E. of Bonthe, having a total area of c. 271 sq. m.

The protectorate has an area of 27,669 sq. m. It is flat, low-lying, and swampy near the coast, rising gradually inland to 6,000 ft. in the Tingi range. The principal rivers, the Great and Little Scarries, the Sierra Leone, and the Sherbro are navigable by small craft for various distances.

Sierra Leone used to be called the white man's grave, but a determined fight against the mosquito, the clearing of swamps, and greatly improved drainage have made it much less unhealthy.

Both colony and protectorate are administered by a governor who is also c.-in.-c. and president of the legislative council, which consists of 12 official members (heads of the principal govt. depts.), three elected and seven nominated unofficial members, of whom three are paramount chiefs of the protectorate. The protectorate is divided into 13 administrative dists., each in charge of a district commissioner. These districts form three provs., each administered by a provincial commissioner answerable to a chief commissioner who is responsible to the governor. An assembly representing the whole protectorate was convened for the first time in 1946.

The population in 1945 was estimated at 2,087,000, of whom c. 150,000 lived in the colony. The white pop. is less than 2,000. As Sierra Leone

was originally peopled by liberated slaves from all parts of Africa, there are many tribes in the area. But 13 of the tribes, each speaking a different language, are indigenous. The Mende and Temne tribes form a majority of the people, and their languages are widely spoken.

The principal imports are coal, wearing apparel, silk, wines, flour, petrol, electrical apparatus, medicines and drugs, machinery, and vehicles. The most valuable export in 1946 was palm kernels, totalling 46,773 tons, valued at £688,840. Other exports were iron ore, diamonds, piassava, nuts and beans, rubber, cocoa, coffee, gold, platinum, hides, and rice. There are 420,000 acres under rice cultivation, rice being a staple food of the people. Other crops raised for internal consumption include sweet potatoes, fundi, and ground nuts.

There is a main line of rly. from Freetown to Pendembu, 227 m., with a branch line from Baiya Junction to Bumban. Another line connects Pepel, opposite Freetown, with Port Lokko and Marampa. Roads are for the most part primitive, direct road communication between the protectorate and the colony being completed only in 1941.

Freetown (pop. 86,000), chief town of Sierra Leone, is one of the most important sea and air ports in Africa.

The colony of Sierra Leone began with the cession of a strip of land to Captain John Taylor on Aug. 22, 1788, to provide a home for liberated slaves. Periodically additions were made to the colony,



Sierra Leone. Map of the British colony and protectorate on the coast of West Africa

and in 1807 the pen. of Sierra Leone was ceded by its native ruler. In 1896 a protectorate was established over the hinterland, after its boundaries had been fixed by agreement between Great Britain and France on Jan. 21, 1895. In 1928 slavery was abolished in the protectorate, and 215,000 slaves were freed.

Sierra Madre. Name given to the mts. of Mexico. There are two ranges, the Sierra Madre Occidental and the Sierra Madre Oriental, extending almost parallel with the W. and E. coasts, and converging as they approach the S. The loftier summits, some of them more than 10,000 ft., are in the W. range.

Sierra Morena (Span., brown range). Mountain ridge of S. Spain. It rises as a steep scarp from the valley of the Guadalquivir to a height of 1,000 to 1,200 ft. above the level of the Spanish plateau, the Meseta, of which it is really the S. face. The mean elevation is 3,500 ft., and the culminating point is the Cerro de Almenara, 5,920 ft. The Rio Tinto copper mines are in the W.; silver-lead and mercury are also mined.

Sierra Nevada (Span., snowy range). Mountains of S. Spain. The range, of which the crest is less than 30 m. from the Mediterranean Sea, belongs, like the Atlas, Apennines, and Alps, to the great E.-W. system of fold mountains which terminates in the Himalayas. It lies between the valley of the Guadalquivir and the coast, and is about 25 m. wide and 60 m. long. Many peaks rise above 10,000 ft., the chief of them being Mulhacén, 11,420 ft., and Veleta, 11,385 ft. In one of the numerous cirques, the Corral de Veleta, is the most southerly glacier of Europe.

Sierra Nevada. Mountain range of California, U.S.A. It forms the E. boundary of the vast central valley of the Great Basin, and extends N.W. to S.E. for nearly 500 m. The Cascade Range is a N. continuation of the Sierra Nevada, which, in the S., merges with the Coast Range. The slopes are well forested. Sequoias are found only on the W. slope, and gold and silver are found. Several summits exceed 13,000 ft., Mt. Whitney, 14,502 ft., being the highest peak in the U.S.A. See California.

Sierra Nevada de Mérida. Mountain range of S. America. It is a N.E. continuation, for about 250 m., of the E. Cordillera of the Andes from Colombia. It separates the provs. of Mérida and Zamora. The chief peaks are Coluna and Concha, each 15,400 ft.

Sieve, SCREEN, OR RIDDLE. Agricultural implement used for sorting potatoes. The sieve is usually mounted on a stick and shaken by hand, the smaller potatoes falling into a basket below. The modern labour-saving type is called a riddle, and consists of a hopper which feeds potatoes on to two or three tilted oblong graded sieves arranged one above another, through which the potatoes fall into their appropriate baskets. Extra large or imperfect potatoes are lifted off the top sieve by hand.

Sieyès, EMMANUEL JOSEPH (1748-1836). French statesman and political philosopher. Born at Fréjus, May 3, 1748, he entered the Church, and became vicar-general of Chartres, 1784. A member of the provincial assembly of Orléans, 1787, he was deeply concerned with the political situation of France, and his three pamphlets, especially that on the third estate, 1788, attracted wide attention. A member of the states-general and of the national assembly, he produced in 1789 his plan for a new constitution. He sat in the convention, 1792, voted for Louis' execution, entered the committee of public safety, 1795, the council of 500, 1797, and went as ambassador to Berlin, 1798.

He was one of the three consuls with Bonaparte (18 Brumaire), but had little influence. Created count of the empire, 1808, he opposed the return of Napoleon, 1814-15, and lived in exile in Holland, 1815-30. He died in Paris, June 20, 1836. Sieyès was a political thinker of originality, a constitutionalist and enemy of the tyrannies which went before and after the Revolution, but deficient in a talent for practical politics.

Sigerson, GEORGE (1839-1925). Irish historian and poet. Born at Strabane, co. Tyrone, Jan. 11, 1839, he was educated at Queen's College, Cork, and studied medicine in Paris. He wrote many medical books; also numerous historical works. He is, however, best remembered for his translations of Irish poetry; and published two or three volumes of original verse. He became a senator of the national university of Ireland. He died Feb. 17, 1925.

Sigerson, DORA. Maiden name of the Irish poet, Dora Sigerson Shorter, daughter of George Sigerson (v.s.) and wife of C. K. Shorter (q.v.).

Sighisoara. Town of Rumania, in Transylvania, formerly known as Schässburg and Segesvar. It is situated on the river Tarnava

Mare (Nagy Kükküllő), on the rly. between Brassó (Kronstadt) and Sibiu (Hermannstadt). Textiles are manufactured. It was captured by the Russians from the Germans during the Second Great War, Sept. 11, 1944. Pop. 13,000.

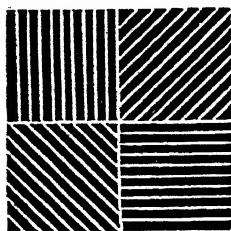
Sight. One of the senses. It involves perception of three things, viz. light intensity, colour, and form. See Eye; Sight Testing.

Sights. Devices on a firearm to assist the eye in laying or sighting a correct aim on a target. The simplest principle is to have a fore-sight on the muzzle, to allow the weapon to be pointed in the true direction of the target, and a back-sight fixed to the breech to give the correct range and elevation and ensure that the projectile does not fall beyond or short of the target. The line of sight is an imaginary straight line passing from the firer's eye through both sights to the point aimed at. On rifles the fore-sight is usually a knob or wedge fixed in an upright position, while the back-sight is a U-shaped piece which may be raised vertically or moved laterally.

Until 1942 the back-sight on the British army rifle had a scale allowing sighting over ranges from 200 to 2,000 yds. Then a simplified type of rifle was introduced with two aperture sights at the rear, one for 200 yds., the other for 400 yds. Elaborately sighted rifles to give a variety of ranges are now restricted to snipers. Direct sighting on a target is seldom used except with rifles, machine-guns, and light anti-tank and A.A. artillery. Nearly all field artillery above 40-mm. calibre is indirectly sighted, i.e. the gun is laid for line and elevation according to requirements.

A.A. weapons of .5 calibre and below are directly sighted through ring and aperture or ring and bead sights; the latter method is more accurate but requires a highly trained gunner to hit the target. All other types of A.A. artillery are sighted and fired by predictor. In bad visibility or at night, sighting is by radar direction. Guns mounted on military aircraft have gyroscopic sights fitted in the pilot's cockpit or gunner's turret; these operate efficiently even when the aircraft firing is 'making violent movements while taking evasive action. Similar types of sights, but for indirect firing, are employed for ranging naval artillery, which also uses radar for night firing. See Artillery; Ballistics; Bomb Sight; Predictor; Range-Finder.

Sight Testing. Determination of acuteness of vision. It may be required by a person who complains of imperfect sight, or by one seeking admission to state service. A person's sight is tested, after careful examination with ophthalmoscope and retinoscope, by placing him with his back to the light and showing him in a good light a board containing a series of rows of letters known as test types. Each row is intended to be read at a definite distance, and the letters of each row are smaller than those of the preceding row. The test type is generally designed



Sight Testing. Left, test for astigmatism; with normal sight all the lines should appear equally distinct. Right, card with test type (reduced to $\frac{1}{2}$)

to be placed at a distance of 6 metres from the person who is being examined. If v be the acuteness of vision, d the distance between the eye of the individual and the test type, and D the distance at which the type should be distinguishable, then $v = \frac{d}{D}$. Thus if at 6 metres the type distinguishable at 6 metres can be read, then the vision is $\frac{6}{6} = 1$, or normal. The stereoscopic sense can be tested by placing a red glass before the right eye and rotating a multiple glass rod before the left eye. With normal binocular vision the red spot appears bisected by a white streak.

Sigismund (1368-1437). German king and Roman emperor, 1411-37. Born Feb. 15, 1368, he succeeded his father, the emperor Charles IV, as margrave of Brandenburg in 1378, and nine years later became king of Hungary by right of his wife Maria, daughter of Louis I (q.v.). His utter defeat by Bayazid I at Nikopolis, Sept. 28, 1396, was the signal for the outbreak of serious disturbances. In 1411 he was elected German king. He summoned in 1414 the council of Constance, which by deposing three rival popes ended the Great Schism. His responsibility for the death of Hus (q.v.), who attended

the council under safe conduct, angered the Bohemians, who contested Sigismund's accession to the throne on the death of Wenceslas in 1419; and it was only after 17 years of bitter warfare that Sigismund could enter the Bohemian capital as king. He died at Znaim, Dec. 9, 1437.

Sigismund I (1466-1548). King of Poland. He was the son of Casimir IV, and succeeded his brother Alexander in 1507. The first years of his reign were spent in correcting the abuses of the government and in repulsing the Russians, on whom he imposed a severe peace settlement in 1514, driving them to Moscow. He died at Cracow, April 1, 1548.

Sigismund III (1566-1632). King of Poland. Son of John III of Sweden and the Polish princess Catherine, he was elected king of Poland, Aug. 19, 1587. He persecuted the Protestants with great bitterness. On the death of his father, Oct. 19, 1592, he succeeded to the throne of Sweden, and was crowned Feb. 19, 1594, but was dethroned in 1604. He retained the Polish crown. He died April 30, 1632.

Sigmaringen. Town of Germany, capital of the former duchy of Hohenzollern-Sigmaringen, which was merged with Württemberg in 1935. It lies on the Danube, 54 m. S. by E. of Tübingen. The chief building is the castle, partly reconstructed after a fire in 1893. Its predecessor was long the residence of a branch of the Hohenzollern family. The castle contains a museum with a remarkable collection of antiquities, a picture gallery, library, and armoury, the pictures, books, and manuscripts being valuable. Near by are iron foundries, and there is a trade in wood and cattle. After the Second Great War Sigmaringen came within the French zone of occupation. Pop. 5,000.

Sign. Mark or token, that by which a thing is represented or

known. The term is also used for an omen or portent. Signs, in so far as they may be pictorial symbols, may form specialized languages of their own, as in the examples of road signs, mathematical symbols, heraldic devices, railway and traffic signals; or they may be a mark of individual identity as in flags or trade marks (see Flags; Road Signs; Signaling; Symbol; Trade Mark, etc.).

A particular use of the term refers to such displays of identity as are seen in village signs, inn signs, and shop signs. From the last, which originally gave prominence to the type of shop by means of, e.g., the barber's pole, the tobacconist's Highlander, the grocer's gilded ham, the surgeon's red lamp, the chemist's coloured bottles, and the pawnbroker's three gilded globes, evolved the signboard which publicised the name of the proprietor. At first this was most usually fixed over his shop window or door, the name being painted on wood by a signwriter, sometimes with additional gilding to the letters. But many other methods were soon evolved of obtaining greater publicity, e.g. the hanging or projecting sign, more calculated to catch the eye of the passer-by; the sky sign, with metal letters fixed to a framework above the building, with the sky as a background; various forms of glass sign; the illuminated sign (electric lamps, fluorescent tubes), many of them constantly changing their patterns. When such signs were used apart from shop premises, they entered the field of advertising.

Inn signs in England have aroused the interest of artist and antiquary alike. Innkeepers were compelled to exhibit signs, and their sources of inspiration were



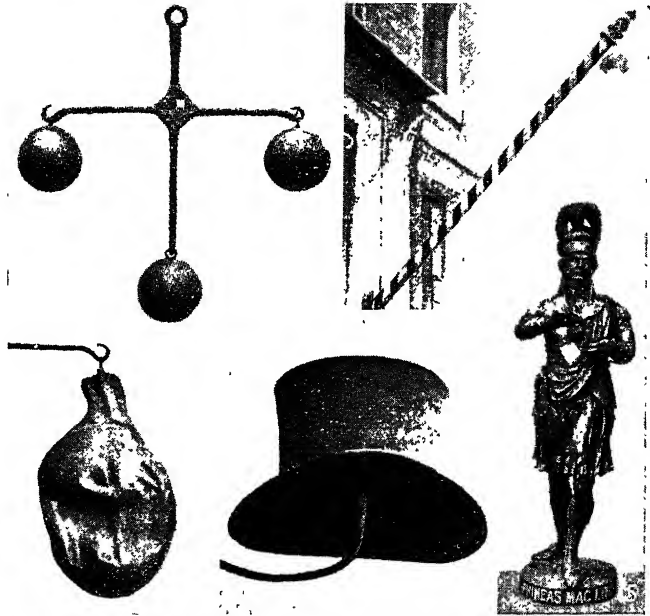
Sigmaringen, Germany. The Hohenzollern Castle, built on a rock rising abruptly from the Danube

innumerable. Family badges and coats of arms suggested all the Red Lions, White Harts, and other heraldic signs. Others displayed portraits of notabilities, real and legendary, rebuses on innkeepers' names, and random combinations of objects of all kinds. Examples of rebus signs include The Brace (kept by two brothers Partridge), The Hat and Tun (kept by a man called Hatton), The Bag o' Nails (The Bacchanals). Among famous artists who painted inn signs is Hogarth. In the 20th century there was some revival of interest and practice in the pictorial side of the art in certain parts of the country, e.g. West Sussex, where a novelty was introduced by the painting of two equally appropriate designs, one each side of a projecting signboard, the one with an old time setting, the other contemporary in its details. See Signpost.

Signac, PAUL (1863-1935). French painter. Born in Paris, Nov. 11, 1863, he studied under Guillaumin, through whom he became acquainted with Impressionist teachings. A friend of Pissarro and Seurat, he developed the theories and technique of the Neo-Impressionist school. His work was dominated by an acute sense of the laws of contrast, and his technique was the logical consequence of Monet's impressionism. Instead of applying dots as in pointillism, he placed pigment in small rectangles, giving his canvases the appearance of mosaics. He published works on Delacroix, 1899, and Jongkind, 1927. He died Aug. 17, 1935.

Signalling. Audible or visual means of transmitting and receiving information between two points on a prearranged system. Except on railways, in the regulation of road traffic, and in ground communication to aircraft, there is little distinction between civil and military signalling.

Man first signalled with his arms; but any fold in the ground soon renders these invisible. Smoke signals, another early form, are still used by primitive peoples; codes have been made possible by covering or uncovering the smoke column with skins or cloth. At night there were beacons. Aeschylus's Agamemnon describes how the watcher on the palace roof at Argos sighted the beacon announcing the fall of Troy. This was for centuries the principal means of signalling in Great Britain. In the 14th century there was a beacon chain along the coast from the



Sign. Signboards exhibited by London tradesmen. 1. Pawnbroker's sign, from an old shop in Drury Lane. 2. Barber-surgeon's pole, with bleeding basin, 18th century. 3. Gilded ham, used by provision merchants. 4. Hatter's sign. 5. Highlander, formerly placed outside tobacconists' shops

1. Guildhall Museum, London. 2. Wellcome Historical Medical Museum, London

Humber to Cornwall to give warning of enemies from the Continent, and a most efficient system was set up when the Spanish Armada was threatening England. A message could be transmitted to London from the coast in 15 minutes by this means.

In 1684 Robert Hooke introduced a signalling device consisting of a black board on a frame. By means of pulleys, 24 white stencils representing letters of the alphabet (omitting I and V) were brought into position in front of the board. The next step was the semaphore (*q.v.*), which remained in use on land until the introduction of the electric telegraph. Military field telegraphs were first used in the Crimean War. From 1866 field telegraph companies of the Royal Engineers provided the principal long-distance communication in land warfare until largely superseded by radio communication in the Second Great War.

Heliograph and Lamp

The earliest recorded use of the heliograph principle was in 490 B.C., when the Persian "fifth column" in Athens signalled to the Persian fleet by reflecting the sun from a polished shield. The same system was used by both sides in the battle of Marathon, and by Alexander the Great. Heliographs were not again used until

1870, when John Mance introduced the mirror-reflector type. By covering or uncovering the mirror, messages can be transmitted in Morse. Mance's heliograph was first used in the Afghan War of 1879.

Two forms of lamp signal will convey messages in Morse. One, mounted on a tripod, consists of a 12-volt lamp taking current from dry cells; it has a range of 2-4 m. by day and 6-12 m. by night. The Aldis lamp has the same power and range, but is held in the hand. A trigger attachment alters the angle of a mirror reflector behind the bulb, so cutting off or restoring the light to produce Morse flashes.

All forms of visual signalling are becoming obsolete in land warfare, as transmission is easily detected from aircraft. Radio transmitters enable coded messages to be sent over greater distances with less chance of error. When battles were fought at short range, orders in the field were sent by bugle, whistle, or drum. Bugle and whistle survived into the First Great War. Signalling by bells originated in China, and in the 14th century was accepted in England as a warning of invasion—as again in 1940, when no church might ring its bells except to raise the alarm.

Naval signalling developed from the Phoenician practice of hoisting

shields in various parts of a ship's rigging and displaying multi-coloured pennants. In 1543 the French introduced the first sea signalling manual. In 1660 they started coloured flags for letters of the alphabet. After the Restoration, the duke of York tried unsuccessfully to have the French system adopted by the Royal Navy, and British signalling at sea remained inefficient until 1800, when the Admiralty adopted Popham's telegraphic signals of nine numbered flags, which could express 999 combinations, 26 letters of the alphabet, and 973 words or phrases. This code remained in use throughout the navy and merchant service until 1817, when Marryat, the novelist, introduced his code for the merchant service. This used 18 flags only, and ignored vowels. In 1857 Marryat's system was adopted, with slight variations, as the commercial code of flag signalling, and in 1887 was developed into the International Signal Code.

International Signal Code

After revision in 1934, the present International Signal Code, with a flag for each letter, was universally adopted. Every merchantman and warship carries a complete set of flags: 26 square alphabetical flags, ten numeral pennants, three triangular substitute flags, and an answering pennant. The first substitute repeats the first flag in the group hoisted. Each alphabetical flag may also signify a standard order or phrase. When flown from a ship in harbour, the letter P means "All aboard, I am proceeding to sea"; but at sea it means "Your lights are out." The letter A alone indicates that the vessel is on speed trials. Q, a plain yellow flag, indicates that the ship is liable to quarantine, but, having no sickness on board, desires a free pratique. L (Yellow Jack), divided into yellow and black quarters, formerly denoting contagious disease on board, means "You should stop; I have something important to communicate." Other single-letter signals are: C. Yes; D. Keep clear of me; F. I am disabled; G. I want a pilot; K. Stop your ship; N. No; O. Man overboard; S. I am going full speed astern; U. You are running into danger; V. I require assistance. T, followed by figures, represents time (24-hour system); P followed by four numerals indicates latitude and longitude. There are two-letter, three-letter, and four-letter groups.

Only five colours, black, white, red, blue, and yellow, are needed

in the whole range of 40 flags. Crosses, bars, stripes, and other marks are so arranged that should bad visibility prevent the colours being distinguished the flags are instantly recognizable. In normal visibility, a signal can be read by glass from 5 m. Flags are never hoisted more than four at a time, and usually in combinations of letters and numerals that represent whole messages. The merchant navy usually spells out the words letter by letter, except standard phrases.

To acknowledge a signal, the answering pennant is hoisted close up the truck; when it is lowered to the dip, the next hoist is made by the answering ship. In the event of the receiving ship being unable to read a signal, she keeps her pennant at the dip and herself hoists U W—"I cannot distinguish your flags." The three substitute flags avoid repetition of a letter in a single hoist.

For reaching beyond the visibility of colour, an alphabet is formed from combinations of black flags, pennants, and bells. Visual weather-signalling from shore to ship is by black cones or lamps. Underwater signalling, as between submarines, is by sound waves on the principle of the hydrophone (*q.v.*), while aircraft rely on light signals or radio telegraphy and telephony. Visual ground-to-air signalling is used (*see* Colour Plate).

Railway Signalling

Before telegraphy was developed, trains were controlled by a time limit, and one was not allowed to leave a station until some minutes had elapsed after the departure of the preceding train. With the advent of telegraphy came the block system which, controlled by pivoted arms from a signal box, prevented two trains being on a section of line at the same time. Next came the lock and block, which interlocks the signals and telegraphic instruments, so forcing the signalman to maintain the section unoccupied. On many lines in Great Britain, multiple-colour light signalling is replacing semaphore equipment. Red, yellow, or green beams of light of high intensity can be read in all but thick fog. One system uses a single coloured lens, a lamp being provided for each aspect. The searchlight type has one lens and one lamp; a moving "spectacle" carrying red, yellow, and green filters is placed between them and electrically actuated to interpose whichever filter is required. Other colour signals are used for shunt-

ing, etc. (*see* Colour Plate). Where lines carry exceptionally heavy traffic, track circuit signals are installed, allowing the trains automatically to set the signals behind.

Road traffic is regulated either by hand signals or by traffic lights; these latter either work on automatic time phases or are actuated by the traffic passing over strips in the road in electrical contact with the signal post.

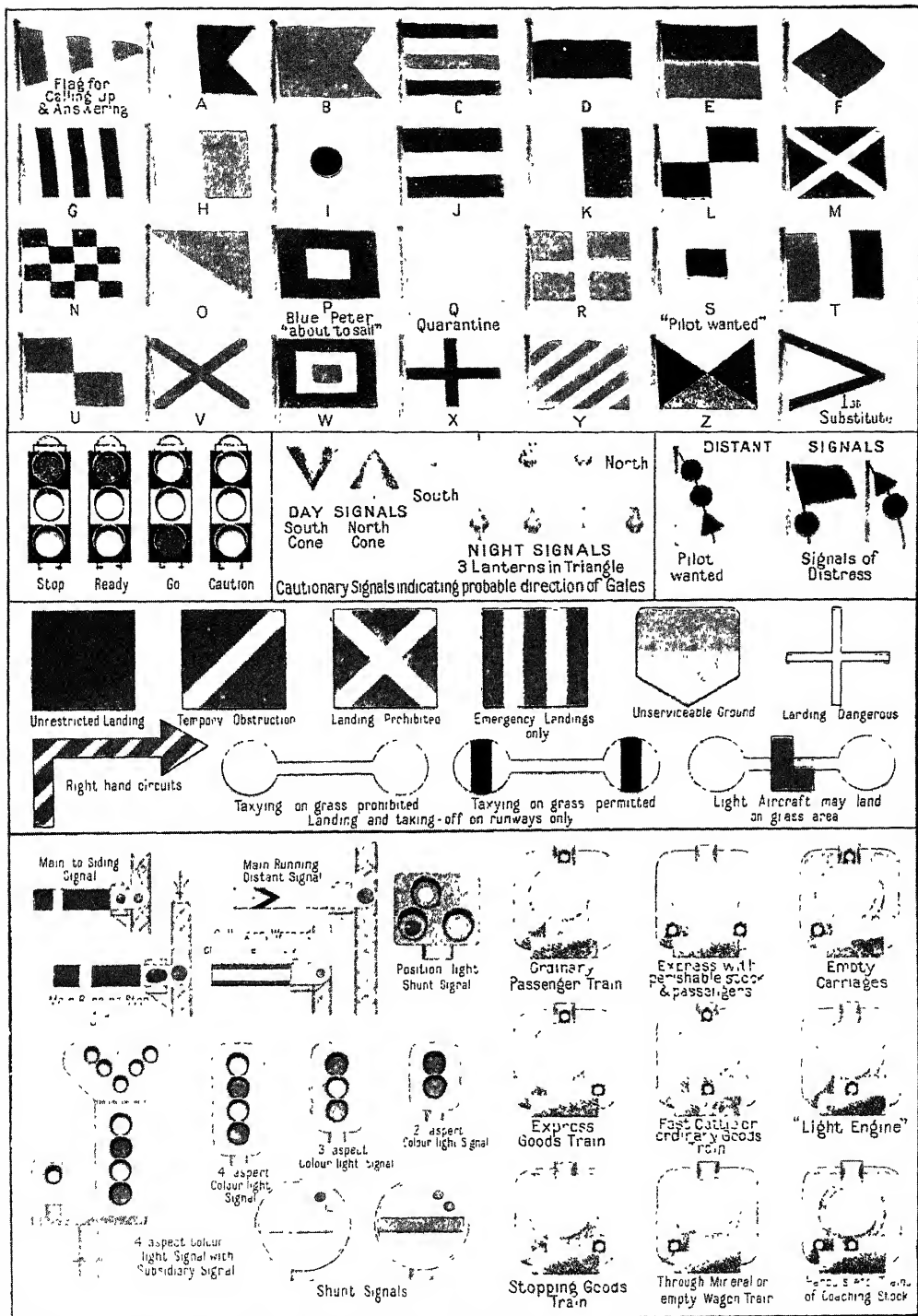
Signature (Lat. *signum*, a mark). Literally, the name of a person written by himself or herself. In printing, it means the letters or figures printed at the foot of the first page of a sheet or section of a book or magazine as a guide to the binder. Artists' signatures are a comparatively modern device, those of old masters usually consisting of monograms which vary in different works.

Episcopal signatures consist of the chief Christian name followed by an abbrev. of the name of the province or see, the latter sometimes in Latin, *e.g.* Archbishop of Canterbury, Geoffrey Cantuar; Archbishop of York, Cyril Ebor.

Signature. In music, a sign or signs placed on the stave indicating (1) pitch, (2) time. As to (1) the clef (*q.v.*) is one signature, but the European system of tonality necessitates another, in order to show what notes are permanently inflected for a given key, the requisite sharps or flats being placed on each stave. The minor key uses the same signature as the major key three semitones higher, its normal seventh note being raised by an accidental ♯, ♮, or x. Naturals are shown in a signature only when it is desired to contradict previous signs.

(2) The time signature is put at the beginning, or when a change is wanted. It consists of two figures, one above the other, the lower showing how the semibreve is divided, and the upper stating how many of these divisions are included in the bar.

When the beat is an undotted value (simple time), the top figure indicates the number of beats; but not when it is a dotted value (compound time), as the semibreve is indivisible into an aliquot number of dotted values. Therefore the number of notes next less in value is shown. Thus $\frac{2}{4}$ stands for two plain crochets, and $\frac{6}{8}$ for two dotted crochets in the bar. Generally the beat is a crochet, plain or dotted, but occasionally other values are used. Four crotchets in a bar is sometimes



Top: Flags of International Code of Signals used by the merchant navies of all nations, together with cautionary signals for gales and examples of signals used for distances where coloured flags would be indistinguishable. Immediately below, on left, road traffic signals used in the U.K. Centre: An Ministry ground signals to aircraft. Bottom: railway signals and locomotive headlights to indicate class of train, as employed by British Railways in 1948

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SIGNALLING: EXAMPLES OF FLAGS AND OTHER SIGNALS IN DAILY USE

shown by C , which is a survival from the medieval period when a circle meant triple or perfect time, and a half circle, imperfect time (duple or quadruple).

With a stroke through it, C stands for two minims, and with two strokes C for four minims (alla breve). See Key Signature.

Signature Tune. Particular tune adopted by a popular musical entertainer, e.g. dance band leader or theatre organist, to introduce or conclude his programme, especially when broadcasting. It was first popularised by the band leader Jack Payne, who began about 1930 to open and close all his radio programmes with the tune Say It With Music. The practice was widely followed in Great Britain, the U.S.A., and elsewhere.

Signet (Lat. *signum*, sign). Word meaning something signed or sealed. A signet-ring is a ring which contains the private seal of the wearer. See Ring; Seals.

Signet, WRITER TO THE. In Scotland, a member of a society of solicitors; though a solicitor need not belong to the society. The society of writers to the signet probably originated among the clerks of the secretary of state, who had keeping of the Scottish king's seal. The writers were recognized as members of the college of justice in 1532, and certain classes of writs, etc., which had to be signetted, were drawn by the writers to the signet. The chief officer bearer is the keeper of the signet, and is appointed by the crown, and members use the initials W.S. after their names.

Sign Manual. Autograph signature of the sovereign. Certain executive documents are so signed by the king in place of using the great seal. It may also be an authority for fixing the great seal to a document, and in either case the king's signature is counter-signed by a minister. See Seals.

Sign of the Cross, THE. Religious melodrama by Wilson Barrett. It was produced, Jan. 4, 1896, at the Lyric Theatre, London, where it ran for 435 continuous performances, and thereafter toured the world. The plot hinges on the persecution of the early Christians by Nero. Wilson Barrett played the hero. A film version was seen 1933.

Signorelli, LUCA (c. 1441-1523). Italian painter. Born at Cortona, he studied under Piero della Francesca, and was influenced by Antonio Pollaiuolo and Donatello. His greatest extant work is the series of frescoes of the Last Judge-

ment in Orvieto Cathedral (1499-1504). Other notable paintings are at Cortona and Rome (Vatican).

Signpost. Vertical post with one or more horizontal boards at its summit to indicate direction.



Signpost of the type erected and maintained by county councils, bearing name of parish on ring above the arms

The boards carry the names of one or more places, with their mileage from the position of the post, and point in the direction of the places indicated. The post also bears the name of the parish and county in which it stands. British signposts are generally set up at cross roads and junctions, and their erection and maintenance is the responsibility of the county council under direction of the ministry of Transport. Others are maintained by the R.A.C. and A.A. The latter body has fixed circular sheets of metal at the entrances and exits of villages and towns; painted yellow with black lettering, they give the name of the place and its distance from London. Under defence regulations (*q.v.*) of the Second Great War, it became obligatory in 1940 to remove signposts likely to assist an invading enemy.

Sigüenza. City and episcopal see of Spain. It is in the prov. of Guadalajara, on the Henares river and the Madrid-Saragossa rly., 87 m. N.E. of Madrid. The ancient Sagontia of the Celtiberians, it is built on the slopes of a hill, 3,500 ft. high, crowned with a castle. The cathedral, dating from the 12th century, has its front flanked by two lofty rectangular towers. The modern part of the town, in the N., with wide boulevards and gardens, contrasts with the winding streets of the old Moorish quarter. Pop. 4,500.

Sigurd. English form of the Old Norse name Sigurdhr, under which name Siegfried, the legendary hero of German epic, especially of the Nibelungenlied, appears in Icelandic literature, notably in the older Edda, and in the Völsunga Saga. The name was borne by two kings of Norway, Sigurd I, the Crusader (d. 1130), and Sigurd II, called Mund (d. 1155). See Nibelungenlied; Siegfried; Völsunga Saga.

Sigurðsson, JON (1811-79). Icelandic scholar and politician. Born June 17, 1811, the son of a country pastor, he graduated in Copenhagen in 1833, and for some years was secretary to Bishop Jonsson. He was the first president of the Icelandic Society, and edited the learned collection *Diplomatarium Islandicum*, with contributions on Icelandic law, history, and politics. Chief champion of his country in her fight for freedom, he was elected member, and afterwards Speaker, of the Althing, and in 1874 his struggles for home rule for Iceland were successful. Before his death on Dec. 7, 1879, he was a national hero. Sigurðsson's valuable library is now the property of the state.

Sikandarabad. Town of India, in the Uttar union, in Bulandshahr div. It is situated N.W. of Bulandshahr town, and manufactures fine muslin. Pop. 21,000.

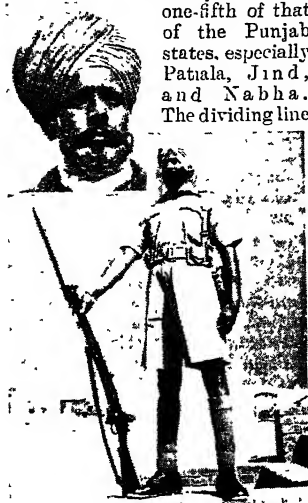
Sikandra Rao. Town of the Uttar union, India, in Aligarh dist., almost midway between the Ganges and the Jumna. Founded in the 15th century, it was a centre of rebellion during the Mutiny of 1857. Pop. 13,000.

Sikang. Province in W. China bordering Tibet. It contains 46 counties and two administrative bureaux, with Kangting as its capital. Other cities are Yaan and Sichang. Sikang forms part of the E. Tibetan plateau, the whole of its W. region being mountainous. There is no rly., and only two highways link it with the provs. of Szechwan and Chinghai. Its main products are livestock, gold, and wheat. The giant panda inhabits the high mts. bordering Sikang and Szechwan. Area 164,991 sq. m. Pop. 1,756,000, including Tibetans and Lolos.

Sikes, BILL. Character in Dickens's *Oliver Twist*. He is a brutal burglar, whom Oliver is forced to accompany on an expedition. Sikes murders his unhappy mistress, the pathetic Nancy. In a film version of the story (1948) the part was memorably played by Robert Newton.

Sikh (Hind., disciple). Indian religious community. Numbering some 3,000,000, they formed one-tenth of the pop of the British

Punjab, and one-fifth of that of the Punjab states, especially Patiala, Jind, and Nabha. The dividing line



Sikh. A Sikh soldier of the Second Great War. Top: civilian

between India and the dominion of Pakistan in the Punjab runs through the area in which the Sikhs lived, and following partition in 1947 those of the W. Punjab migrated to the E. Punjab, becoming involved in the riots and sufferings of the mass E. to W. and W. to E. migrations of that time. Predominantly of Jat stock, they are hardy, tall, and bearded. The true Sikhs or Singhs wear the five k's: kes, uncut hair; kacch, short drawers; khara, iron bangle; kripan, sword; khanga, comb. In the conical turban, pag, were formerly worn several sharp-edged quoits, chakra, used as rotary missiles in war. They do not use tobacco; they observe the prohibition of wine loosely. They reverence the cow, but reject other Hindu customs, including pilgrimages, girl infanticide, and purdah seclusion. Their non-Hindu marriage rite was regularised by the Anand Marriage Act, 1909. They maintain a Khalsa college at Amritsar, girls' schools, and orphanages.

Sikhism was founded by Nanak (1469-1539) as a monotheistic reform, designed to embrace Hindu and Mahomedan in one brotherhood. Retaining the doctrine of transmigration, Nanak deprecated image worship, priestcraft, and caste, and laid great stress on the ethical side of his teaching, especially the virtues of honesty,

loyalty, justice, and benevolence. Regarded as the first guru, or religious teacher, he was succeeded by nine others—Angad, Amar Das, Ram Das, Arjan, Har Govind, Har Rai, Har Krishan, Tegh Bahadur, and Govind Singh (1666-1708). Ram Das founded the Sikh sacred city Amritsar. Arjan compiled the original scriptures, Adi Granth, a composite work in metrical form.

The supplementary Dasam Granth made by Govind is accepted by some extreme sections only. Govind, who appointed no successor, declared that the Granth is the true guru. The temple copies of it now receive idolatrous worship, and are carried in procession on Nanak's birthday.

Sikh membership is not hereditary, but secured by individual initiation at the khanda pahul. This rite, inaugurated by Govind, is preceded by ceremonial ablution, whence it is sometimes called baptism. The candidate drinks in ritual communion with five initiated Sikhs amrit or nectar stirred with a dagger, being henceforth called Singh, lion. These warrior Singhs, the long-haired Kesdharis, or wearers of the five k's, are distinguished from the Sahijdharis, mostly cultivators and mechanics, who follow the Nanak rule.

After Har Govind, the fraternal spirit of the earlier gurus gave way before militant aspirations. Under Govind Singh the community was called Khalsa, the property of God. After him confederacies, misls, were formed, and the hereditary chief of one, Ranjit Singh (1780-1839), combined all into a formidable power, with which a British treaty was made in 1809. The anarchy following his death led to the Sikh wars of 1845-46 and 1848-49, resulting in the annexation of the Punjab. During the Indian Mutiny the Sikhs were enrolled and did good service in the relief force which marched from the Punjab to Delhi.

In the Two Great Wars

In the First Great War they distinguished themselves on many fronts. Because of political differences with the British, the number of Sikh regiments was later reduced; at the start of the Second Great War only one remained, and Sikhs generally fought in companies side by side with Punjabi Muslims, Dogras, or Rajputs. In both Great Wars several Sikhs won the V.C. See Amritsar; Army colour plate; India. Consult Sikh Ceremonies, Sirdar J. Singh, 1941; The Sikhs, J. Archer, 1946; Rise of Sikh Power, N. K. Sinha, 1947.

Sikh Wars. Two campaigns preceding the annexation of the Punjab by the British, 1845-46 and 1848-49. The death of Ranjit Singh in 1839 left the Sikh army which he had created leaderless, but confident of its invincibility. Towards the end of 1845, this army, 60,000 strong, crossed the Sutlej, and marched on Ferozepore. At news of the invasion Lord Gough (*q.v.*) hastened thither, and after a sharp engagement at Moodkee, Dec. 18, defeated the Sikhs at Ferozeshah (*q.v.*), Dec. 21, driving them across the Sutlej.

The following month they reformed, crossed the river again, repulsed Sir Harry Smith's force at Buddowal, Jan. 20, 1846, but were totally defeated by Smith eight days later at Aliwal (*q.v.*). Gough's victory at Sobraon, Feb. 10, proved the final blow, and the British immediately invaded the Punjab. Rajah Dhuleep Singh submitted in person, and Lahore was occupied.

The continued unrest and plotting of the Sikh rulers led to another outbreak in the autumn of 1848, when Shere Singh collected an army of 15,000, and declared war. Gough opened the campaign by an advance across the Ravi, and after severe repulses at Ramnagar and Sadulapore, defeated the Sikhs at Chillianwalla (*q.v.*), Jan. 13, 1849, although the battle was indecisive. The capture of Mooltan and the battle of Gujarat closed the war, and the Punjab was annexed to British India, March 29, 1849. Consult The Sikhs and the Sikh Wars, C. J. S. Gough and A. D. Innes, 1897.

Si-kiang or WEST RIVER. River in S. China. It rises in the E. of Yunnan and flows through Kwangsi and Kwangtung. Including the Hungshui, which comes down from Kweichow prov. and joins it at Sunchow, the course is 1,250 m. The river is navigable for steamers for over 200 m. to Wuchow, and for smaller craft another 100 m. At Samshui the Si-kiang divides into several branches, forming the Canton delta. The Hungshui is sometimes regarded as a tributary, the name Si-kiang being given to the river below Nanning, where the Yukiang and Likiang meet.

Sikkim. State in the Himalaya Mts., a protectorate of the government of India. Sikkim lies between Nepal on the W. and Bhutan and Tibet, with which it has trade communications, on the E., with Kunchinlunga on the N. border, and is crossed by the trade route through the Chumbi valley

to Gyantse in Tibet. There are extensive forests and state fruit gardens, and the chief products are rice, Indian corn, and millet, woolen cloth, and oranges. Most of the people are Nepalese, the others are Lepchas and Bhutias; most are Hindus, though the official religion is Buddhism. Gangtok is the capital. Area, state, 2,818 sq. m. Pop. 121,520. Consult Himalayan Village, G. Gorer, 1939.

Sikorski, Wladyslaw (1881-1943). Polish statesman and soldier. Born in Galicia (then



Wladyslaw Sikorski,
Polish soldier

Austrian), May 30, 1881, he studied engineering at Cracow and Lwow universities, and became a leader of the movement for the liberation of Poland from tsarist Russia. Sikorski served in the First Great War and in the Polish-Russian conflict of 1919-20, becoming chief of staff, and in 1922 premier. Minister of war 1924-25, he retired to France for ten years, 1928-38, because he disapproved of Pilsudski's methods of govt. Sikorski was in Poland when it was attacked by Germany in 1939 but, after his services had been refused by Smigly-Rydz, he escaped to France, where he at once started to build up an army of 60,000 exiled Poles, and was chosen prime minister and c.-in.-c. in the exiled govt. He visited Canada and the U.S.A. in 1941 and in 1942 to secure aid for Poland; and in 1941 also visited Moscow, where he signed, July 30, a treaty with Russia which annulled the Russo-German partition of Poland and restored diplomatic relations between the Polish govt. and Russia. But the good will he thus

promoted did not last, and when Sikorski was killed in an aeroplane accident at Gibraltar on July 4, 1943, as he was returning from a visit to Polish troops in the Middle East, Russia had already broken off diplomatic relations again.

Sikorsky, Igor I. (b. 1889). American aircraft designer of Russian birth. In 1913 he built and flew the first multi-engined aeroplane, and during the First Great War designed Russian Army bombers. In the U.S.A., where he was naturalised, 1928, he designed the Sikorsky amphibian and helicopter, the latter adopted for military use 1942 and for civil 1946.

Silage (Gr. *siros*, pit for corn). Succulent fodder produced by Ensilage (*q.v.*)

Silas Marner. A short novel by George Eliot. It was published in 1861, with the sub-title, *The Weaver of Raveloe*, and is generally regarded as the most artistic of her masterpieces. In it, as in her earlier novels, she drew upon her recollections of life in the English Midlands. Silas Marner, the solitary weaver suffering under unjust suspicion, finds a dead woman and a living infant near his door and adopts the child, who becomes his regenerator.

Silbury Hill. Prehistoric mound in the Kennet valley, Wilts. Built of chalk rubble, flat-topped, 552 ft. across, 135 ft. high, its pre-Roman origin is shown by its being skirted by a Roman road. It is probably a Neolithic or Bronze-age barrow (*q.v.*), although excavations have revealed no interment.

Silchester. Village in N. Hampshire, the site of the Romano-British town of Calleva Atrebatum. Its systematic excavation from 1890 onwards revealed walls, streets, and house-foundations, besides an invaluable assemblage of objects, now in the Reading Museum. Within an area 820 yds. by 803 yds. were a basilica, forum, residences of opulent merchants, dyers', millers', silversmiths', and other establishments. A church, 42 ft. by 27 ft., probably 4th century, was the first undisputed Christian edifice in Britain. Apparently built upon a late-Celtic earthwork, Silchester's population, with no military element, never exceeded

3,000. The amphitheatre, accommodating 10,000 spectators, was second only to Maumbury Rings.

Silencer. Component of an internal combustion engine, designed to silence emission of exhaust gases. If the gases escape direct into the atmosphere they make a considerable noise, being still under appreciable pressure. They are therefore led by an exhaust pipe into an expansion chamber; on leaving the chamber the noise is much reduced owing to the reduction in pressure which has occurred through expansion. In its simplest form the silencer is a sheet-steel cylinder containing one or more baffle plates to prevent the exhaust gases from rushing straight through. The exhaust pipe is connected to one end plate and a tail pipe to the other.

Silene (Gr. *stalon*, saliva). Genus of annual and perennial herbs. Of the family Caryophyllaceae, they are natives of the N. temperate regions, especially the Mediterranean. Commonly known as catchflies andampions, 8 species are found wild in Britain. They have smooth round stems, with thickened joints. The paired leaves vary from a broad lance-shape to slender awl-shape; and in many species the leaves or the whole plant is covered with a sticky



Silenus. An ancient
statuette at Naples

Silenus. In Greek mythology, the companion of Dionysus (Bacchus), son of Hermes, or, according to other accounts, of Pan. He is generally represented as an old man, stout and of cheerful demeanour, bearing a wine-bag and always intoxicated. He possessed prophetic powers. See Midas.



Silchester, Hampshire. Foundations of the first Christian church in Britain

Silesia (Pol. Slask; Czech, Sllesko). Area of E. Europe, c. 17,000 sq. m. in extent. Here a Celtic pop. lived until c. 100 B.C., it was subdued by the Teutonic Vandals, who, in turn, were dispossessed by Slav, Polish, and Wendish tribes, c. A.D. 400, but remained in parts of the area. Bohemians conquered the land in the 10th century and, from about 1100, fostered German immigration, especially from Bavaria and Thuringia. Most of the towns and industries, and Silesia's civilization, date from that time.

Through the intervention of the German Emperor Frederick I in 1163, the three sons of a Polish ruler were granted separate duchies in Silesia; the rule of these Piast dynasties, with many subdivisions, lasted until the 16th century, under at different times Polish, Bohemian, and Austrian suzerainty. Under an agreement of 1537, Frederick II of Prussia claimed Silesia from Austria and, in his wars against Maria Theresa, 1740-42 and 1744-45, conquered it. It was enlarged in 1815 by the transfer to Prussia of the Saxon dist. of Upper Lusatia. After the First Great War the Hultschin dist., 1,707 sq. m., went to Czechoslovakia (pop. 1935, 738,000); while about 1,630 sq. m. (pop. 1,315,000), including the Teschen area, went to Poland by decision of the League of Nations, Oct. 20, 1921, after a plebiscite of the previous March. The rest, two provs., Upper Silesia, 3,750 sq. m., pop. 1,482,000, and Lower Silesia, 10,270 sq. m., pop. 2,301,000, remained part of Germany.

The mineral wealth of the area was the reason for these changes. Of the rich Silesian coalfields, the bulk of which had previously been German, Poland secured two-thirds: in 1913, Silesia produced 43 million tons; in 1935, German Upper Silesia produced 14 million tons, Polish Silesia 30 million tons. Poland also received the great Königshutte and Katowice steel industry, the huge smelting houses of Tarnowice, and nearly the whole zinc and lead industry, the famous chemical (nitrogen) works of Chorzow, and several spas. Lower Silesia also (still German) had important coal and lignite mines, engineering works, a huge glass and ceramic industry, and, most important, linen and cotton manufactures. It was, moreover, a main supply region for the rest of Germany of grain, sugar beet, potatoes, fruit, vegetables, cattle, cattle products, poultry, and eggs.

Numerous spas and health resorts in the Sudeten range contributed to the economic welfare of a population which, through centuries of war—an attack by the Mongols in 1241, the Thirty Years' War in the 17th cent., the Seven Years War in the 18th—had been prevented from accumulating wealth. Silesia, however, was rich in thinkers and poets, e.g. the mystics Jacob Boehme and Angelus Silesius, the poet Martin Opitz and, in the 20th cent., Gerhart Hauptmann. Silesians clung to their old traditions, costumes, and myths. All of German Silesia E. of the Oder passed under Polish administration after the Second Great War under the Potsdam agreement, 1945, and the bulk of its German inhabitants were expelled without compensation. The people of German origin in Sllesko, Czechoslovak Silesia, were also expelled, some 3½ million Silesians thus becoming refugees in W. Germany.

Silhouette, ÉTIENNE DE (1709-67). French financier. Born at Limoges, July 5, 1709, he studied



Silhouette, depicting Garriek, the actor (right), conversing with Tobias Smollett, the novelist

finance, and held several civil appointments before being appointed, in 1759, controller-general of France, through the influence of Madame de Pompadour. He at once attacked the privileges of the nobles, and his crude plans of spoliation raised a storm of protest and ridicule, his name becoming a synonym for any figure reduced to its simplest form. In this sense it was later applied to a shadow portrait in profile cut from black paper. Silhouette was compelled to retire, after holding office less than a year, and died at Briarsur-Marne, Jan. 20, 1767.

Silica. Name popularly applied to silicon dioxide, SiO_2 . It is one of the commonest substances in the crust of the earth, being known in various forms, e.g. quartz, sandstone, feldspar, and

other rocks. When coloured by the presence of minute traces of impurities it forms amethyst, chalcedony, flint, and opal. In the pure state, as rock crystal, it is clear and colourless. Kieselguhr, or diatomaceous earth, is a form of silica which is used as a basis for dynamite and as an insulating packing for steam-pipes. Rock crystal has been extensively used for making lenses, and agate for making small grinding mortars. Traces of silica are also found in the vegetable kingdom, giving strength to the stems of many plants, e.g. the bamboo.

Siliceous Sinter. Deposits of hydrous or anhydrous silica, with a loose porous texture, which is deposited from waters of hot springs. It occurs in great masses in New Zealand. Geyserite is a similar deposit found associated with geysers in Iceland, U.S.A., and elsewhere.

Silicon. One of the non-metallic chemical elements. Its symbol is Si, atomic number 14, atomic weight 28.06. First prepared by Berzelius in the beginning of the 19th century, it does not occur in the free state in nature, although as silica the element is, next to oxygen, the most abundant, being a chief constituent of the earth's crust.

Silicon, also formerly known as silicium, exists in two forms, amorphous and crystalline. An easy way of preparing small quantities of silicon, not, however, chemically pure, is to heat cautiously a mixture of 40 grains of dry powdered white sand with 10 grams of powdered magnesium. A vigorous reaction takes place, leaving a dark-brown amorphous powder behind. This form of silicon takes fire when heated in the air. The crystalline form is obtained by heating strongly, in an iron crucible, metallic aluminium with from 20 to 30 times its weight of potassium silico-fluoride. Silicon in some of its properties resembles carbon. Like carbon, it forms, with metals, compounds resembling alloys, and one atom of both carbon and silicon combines with four atoms of hydrogen. The most widely distributed compound of silicon is the dioxide, or silica (*q.v.*).

Silicon carbide is known as carborundum, and is made by fusing a mixture of coke, sand, and salt in an electric furnace fitted with a carbon terminal. Carborundum is a very hard material, and when finely powdered is used as an abrasive, and in the manufacture of steel in place of ferrosilicon.

With hydrogen and oxygen silicon forms four acids, the chief being metasilicic acid or silica monohydrate (H_2SiO_3 or $\text{SiO}_2\cdot\text{H}_2\text{O}$) and orthosilicic acid or silica dihydrate (H_4SiO_4 or $\text{SiO}_2\cdot 2\text{H}_2\text{O}$). Orthosilicic acid is prepared by adding hydrochloric acid to an alkaline silicate and submitting the result to dialysis, when the sodium chloride and excess of hydrochloric acid are removed, leaving a clear solution of silicic acid in the dialyser. Thus prepared silicic acid is colourless and tasteless, but on keeping for a few days gelatinises to a transparent jelly.

The salts of silicic acid are known as silicates. They occur naturally in large numbers in many mineral forms.

Silicones. Group of substances used for many purposes. Chemically they consist essentially of silicon-oxygen chain molecules having organic side-groups, which are chiefly CH_3 . The silicones have lost their glass-like character by reason of the small mutual secondary coherence of the side-groups as compared with the silicon-oxygen bonds. The liquid silicones have a low vapour pressure which makes them useful vacuum pump oils; they have also good electrical properties. The thicker types of silicones are used as greases which have a characteristic advantage in the retention of their properties over a wide temperature range. Solid silicones in solution are used as varnishes, possessing the property of being water-repelling.

Silicosis. A disease of the lungs due to the inhalation of mineral dust. Miners, stonemasons, and potters are particularly susceptible. The functional activity of the lungs is impaired and a liability to contract tuberculosis created. Inhalation of coal dust does not predispose to tuberculosis. The risk of silicosis is lessened by good ventilation, the use of exhaust fans, by spraying the air and the substance creating the dust, and by the use of respirators. In the bronchial stage the disease can be arrested by a change of occupation. See Pneumokoniosis.

Siliqua. In botany, a dry, generally elongated, pericarp or pod. It consists of two valves held together by a common replum. Familiar examples are the fruit of wallflowers, stocks, and other cruciferous plants. Another example is honesty (*Lunaria*), the siliquae of which are of a broad oval form, often distinguished as a silicula. See Fruit.

Silistria. Town of the Dobruja, on the S. side of the Danube, it is about 75 m. S.E. of Bukarest and 70 m. N.W. of Varna. It is strategically important and has frequently changed hands between Turkey, Rumania, and Bulgaria, being allotted to Bulgaria by the 1947 peace treaty with Rumania. During the First Great War it was captured by the Germans and Bulgarians under Mackensen, Sept. 9, 1916. During the Second, the Russians took it Sept. 8, 1944. Pop. est. 17,000. See Dobruja.

Silius, Gaius. Roman soldier. He lived during the reigns of Augustus and Tiberius, was consul, A.D. 13, and held a command in Germany under 20, taking part in the campaigns of Germanicus. In 21 he gained a decisive victory at Angustodunum (Autun) over the Aedui, who had revolted under Julius Sacrovir. By his relations with Germanicus he incurred the suspicion of Tiberius. Accused of extortion, and feeling that his conviction was certain if he stood his trial, he committed suicide.

Silius Italicus, Gaius (A.D. c. 25–c. 101). Roman poet. He cultivated oratory, modelling his style on that of Cicero, and became a leading advocate. Consul in 68, he went as proconsul to Asia. He was a friend of Vitellius and a patron of Martial. Silius Italicus was the author of an epic poem in 17 books dealing with the Punic War. The poem is derivative and conventional and devoid of genius.

Siljan. Lake of Sweden, in Kopparberg. Situated 25 m. N.W. of Falun, it is an expansion of the Dal river. It is 25 m. long, 7 m. wide, 400 ft. deep, and lies at an elevation of 530 ft.

Silk. Fibre derived from the cocoon of several insects, notably the silkworm. The silkworm, in its larval stage, discharges from an opening in its under lip a fluid secretion which solidifies on contact with air and forms the silk of its cocoon. In silk culture the eggs of *Bombyx mori* are hatched by warmth on paper-covered trays, and the larvae are fed with young mulberry leaves, and after three or four weeks the spinning of the cocoon begins. The intermediate layers of the cocoon are those which are reeled to form raw silk. The cocoons are softened in a basin of heated water, and the ends from several cocoons are wound into a hank around a hexagonal frame.

Raw silk is woven in Japan into the cheap goods (*habutae*) for

which the country is famous, but in Europe the raws are further treated in the process of throwing. The silk is carefully sorted and reeled, and different ends of raw silk are combined and twisted together. Silk thrown and hard twisted for warp is called organzine; the softer twist used for wefts is called tram; and ends combined with no appreciable twist, used for electrical wire insulation, are called no-throws.

Unreelable silk is saved and sold as waste silk for making silk spun yarn. This waste silk is cut into short lengths (dressed) and then spun in a manner somewhat similar to cotton. Spun silk has a more subdued lustre than thrown "nett" silk.

Japan and France

Natural silk consists of two portions, the fibroin or insoluble fibre, and the sericin or soluble gum, removable by boiling in soap and water. Before the Second Great War Japan provided nearly half the commercial crop of raw silk, and China, Italy, and the Levant were the next most productive regions. Silk is grown in France with the aid of bounties, and in several European countries, but cannot profitably be raised in the U.K. The cultivated silks are whitish to yellow in colour, and are finer, smoother, and more lustrous than the brown wild silk, such as is produced from worms feeding upon oak leaves, and is used for tussore and shantung.

In Europe silk is manufactured principally in France (Lyons and St. Étienne), Italy (Milan and Turin), and Switzerland (Zurich and Basel). Silk imported from the Far East was formerly extensively manufactured in the U.S.A., but with the improvement in artificial silk (*v.i.*) thread and the difficulty of securing the raw material owing to the prolonged war conditions in Asia, silk manufacture in the U.S.A. became less important. The silk industry in the U.K. is relatively small, the largest section being that for spinning waste to be woven into mixed goods. The chief centres of spinning are Bradford and Brighouse (Yorks), and of throwing and weaving, Macclesfield. Leek (Staffs) makes silk ribbons and sewing threads. Coventry, Derby, Norwich (crêpe fabrics), Braintree (brocades and damasks), Tiverton (nets), Dublin (poplin), are other centres of note.

The non-smouldering character of real silk lends it a special value for making containers for propulsive explo-

sives for artillery, and silk voiles, the by-products of waste silk dressing, are used for such cloths. Its toughness and elasticity also make silk an admirable material for parachutes. The lustre, softness, and high elasticity of silk make it a valuable luxury article. It readily takes dyes of bright shades.

Bibliography. Silk Throwing and Waste Silk Spinning, E. Rayner, 2nd ed. 1921; Silk Industry of the U.K., F. Warner, 1921; Silk and the Silk Industry, Schober, Eng. trans. Cuthill, 1930; Bibliography of Technical Literature on Silk, F. O. Howitt, 1947.

ARTIFICIAL SILK. This dates from 1853 when a French inventor, Hilaire de Chardonnet, described a new method of producing thread by drawing a solution of nitrocellulose through fine orifices; the process was launched commercially at Besançon during the 1890s. At the same time, the viscose process, invented by Cross and Bevan, was being developed in the U.K. A third method, the cuprammonium process, was developed during the 1900s, and accounted for a large part of the world total of 9,000 tons of artificial silk produced annually during 1910-12. All these processes are described under Rayon. Between the two Great Wars other types of synthetic silk-like fibres were produced, in particular those based on polyamides (see Nylon), and various vinyl based fibres.

In the early stages of production of synthetic fibres, it was logical to experiment with naturally occurring protein-containing materials, fundamentally similar to natural silk (and wool), but after Ferrette had shown in 1935 that satisfactory fibres could be produced from casein, this branch of the industry was much extended. Fibres have also been produced from a variety of proteins, notably from soya beans, ground nuts, and fish. One synthetic artificial silk of British invention, produced in 1946, is a polyester derived from terephthalic acid and ethylene glycol. By varying the conditions of spinning, it is possible to vary the properties of the fibre from a yarn of low extensibility and strength up to 8 gm. per denier, to one of low strength but high extensibility. It is highly resistant to micro-organisms and bacteria, and its general chemical resistance is good, particularly to acids, organic solvents, and bleaching agents. It has low water absorption and does not swell in water. See Wool: Artificial.

Silkeborg. Town of Denmark, in Central Jutland. It is on the rly. to Skanderborg, 25 m. W. of Aarhus, at the head of Lake Jul, and has a hydropathic establishment and paper mills. It was founded in 1844. Pop. est. 20,955.

Silkin, Lewis SILKIN, 1st BARON (b. 1889). British politician. Educated at London

elementary and secondary schools and London university, he became a solicitor. Member of the L.C.C. from 1925, he was chairman of its town

planning committee 1940-45. Labour M.P. for Peckham 1936-50, he was minister of town and country planning, 1945-50, responsible for towns planned during 1946-47. Created baron 1950.

Silkworm. Name given to the caterpillar of the moth *Bombyx mori*, probably native to China but unknown in the wild state. It has a brown head, cream-white body with a few dark marks, and is 3 ins. long. It feeds on mulberry leaves but will also eat lettuce. The chrysalis is enclosed in a dense cocoon of white or yellow silk which yields most of the silk of commerce. The moth itself is greyish-white and about 2 ins. across the wings, the female being the larger. Neither sex can fly. Various other moths have caterpillars that yield commercial silk. They mostly inhabit India, China, and Japan. Tasar, muga, eri, tussore, and other wild silks are derived from these insects. Consult Silkworm Rearers' Handbook, D. A. Cooper, 1942.

Silkworm Gut. Material used in part of a fishing line. Prepared from the viscid secretion of silkworms which is used in the making of the



Lewis Silkin, British politician



Silkworm. Caterpillar of the moth *Bombyx mori* on a mulberry leaf; left, cocoon, spun among twigs

cocoon, silkworm gut is extremely strong and difficult to see when immersed in water. For that reason it has been largely used for attaching the hook on fishing lines. Most silkworm gut is obtained from Spain, Italy, and Greece.

Silky Oak OR TUGGAN-TUGGAN (*Grevillea robusta*). Tall slender tree of the family Proteaceae. A native of Australia, it has large, broad leaves, much divided into numerous small leaflets, the complete leaf resembling a fern-frond. The flowers are orange in clustered sprays. The close-grained wood is pale pink in colour and prettily marked; it is used for cabinet work.

Sill. Block of timber or stone at the foot of a door or window. Also, in a timber building, a long horizontal timber upon which the walls, etc., rest. In fortification it is the inner edge of the bottom of an embrasure. The word is also used for the timber or other material against which the gates of a canal lock close. In mining a sill is the floor of a coal seam; in geology it is an intrusive mass of igneous rock in the form of a sheet beneath the surface. See Canal; Lock.

Sill. In geology, sheet-like intrusion of igneous rock which has been injected along the bedding planes of the country sedimentary rocks. Sills are usually intruded in areas of more or less flat-lying beds, and may be involved in later folding of strata. Sil's may be of almost any dimension, from an inch or two in thickness to hundreds of feet. The great whin sill of N. England, up to 200 ft. thick locally, occurs over an area of some 1,500 sq. m., mainly in Northumberland and Durham. A sill is distinct from a dyke (q.v.).

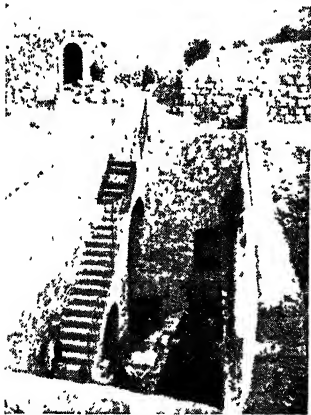
Sillanpää, FRANS EEMIL (b. 1888). Finnish novelist. He was born near Hameenkyrö, Nov. 16, 1888, and had only an elementary education. He soon developed a strong natural talent as a storyteller, and became recognized as Finland's foremost novelist of peasant life. His best novels were *Holy Misery* (1919), *Silja, the Servant-Girl* (1931), *Man's Way* (1932); his short stories, collected in nine volumes, were also notable. He was awarded the Nobel prize for literature, 1929.

Sillimanite. In mineralogy, the name of a silicate of aluminium. Named after Benjamin Silliman, an American scientist, the mineral is grey or brown, and is found in crystalline rocks, notably metamorphic rocks, such as gneiss and mica schist, in the form of long needle-like crystals.

Silloth. Seaport and holiday resort of Cumberland, England. It is on Solway Firth, 22½ m. W.S.W. of Carlisle, with a rly. station. Formerly a fishing village, Silloth was made in 1855 the port of Carlisle. A rly. was constructed and docks built. Chief industries are flour milling and the making of fertilisers, textiles, and plastic goods. For visitors there are good golf links and the usual seaside attractions. Pop. 3,500.

Silo (Gr. *siros*, pit). Hole in the ground in which green crops are stored to be preserved for forage. The term is also applied to above-ground containers, made of wood, concrete, etc., used to preserve green fodder on farms, or for grain storage on a large scale. The process of preserving green crops in silo is called ensilage (*q.v.*).

Siloam or **SILOAM**. Rock-hewn reservoir outside the wall of Jerusalem (See John 9). A conduit,



Siloam. The pool or reservoir outside the walls of Jerusalem

hewn by Hezekiah, c. 700 B.C. (2 Kings 20; Neh. 3), conveyed the Gihon waters from their source in what is now known as the Virgin's fountain to the Siloam pool. In a wall-niche 25 ft. within the lower end, Schick discovered in 1880 a six-line inscription in primitive Hebrew script. It narrates that, when the tunnelling parties, operating from each end, were three cubits apart, their voices guided them in completing the excavation. Conder, who penetrated

the tunnel throughout, made it 1,706 ft. long, 2 ft. wide, and 14½ ft. high, sinking to 1½ ft. in the middle.

Silt. In geology, material intermediate in grain size between sand and mud, i.e. with particles varying in diam. from 0.1 mm. to 0.005 mm. Such material is easily carried by rivers and is often deposited where the velocity of the current is checked, e.g. at the river mouth, where salt water mingling with the fresh helps the silt to settle; hence the term silting up. When the river is in flood and flows out over its floodplain, silt is also commonly deposited and helps to build up the plain, such an area being therefore commonly very fertile. In the Nile the annual flooding of the valley leaves a thin layer of rich silt behind which does away with the necessity for manure. See Alluvium; Delta; Dredging; River.

Silures. Celtic tribe once inhabiting a large part of S. Wales. They offered a stubborn resistance to the Roman occupation of Britain, and were only subdued by the Romans about A.D. 80. Their chief town, Venta Silurum, the modern Caerwent, not far from Chepstow, was made a centre of Roman civilization, with walls, baths, and stately houses. Isca Silurum, now Caerleon-on-Usk, was an important Roman fortress. See Britain.

Silurian. In geology, term proposed by Sir R. Murchison for a series of Palaeozoic rocks. The term is used now for those rocks which lie above the Ordovician and below the Devonian, though Upper Silurian and Lower Silurian were formerly used by geologists for the Silurian and Ordovician periods respectively.

The Silurian period is subdivided into the following series, beginning at the top: (iv) Downtonian, which is transitional into the old Red Sandstone; (iii) Ludlow series; (ii) Wenlock series; (i) Llandovery or Valentian series. Most of these names are taken from localities in the Welsh borderland, where the rocks of this period are well displayed, particularly in Shropshire from Church Stretton to beyond Wenlock Edge, which latter is an escarpment of limestone particularly rich in fossils. In Great Britain the Silurian strata are of two main types or facies: the Welsh borderland rocks are limestones, shales, and sandstones containing fossils of animals which lived in warm, clear, shallow sea waters; the

Silurian rocks of N. Wales, Lake District, and S. Scotland are muddier and were deposited in the more central parts of an elongated N.E.-S.W. trough, the strata in which were later folded at the end of the period by the Caledonian mountain building movements. Intrusions of igneous rocks occurred at the close of the Silurian period in Scotland. Sediments of Silurian age are common in all continents, and have often been folded and rendered slaty by one or more periods of compression. Seaweeds, lycopods, and ferns were common plants of the Silurian period; graptolites, trilobites, corals, etc., were the most common marine organisms; and sharks, which are almost the only vertebrates, occur. See Rock.

Silvanus. In Roman mythology, a benevolent god of gardens, forests, and boundaries, and guardian deity of homesteads. He is represented as a cheerful old man.

Silver. One of the metallic elements, of wide use in the engineering and chemical industries and intrinsically of great value. The chemical symbol is Ag, and the element falls in the first group of the periodic table, its neighbours being copper and gold, to both of which it bears a strong resemblance. It has an atomic number of 47; atomic wt., 107.880; density, 10.5 gm. per c.c.; melting point, 960.5° C., forming one of the fixed points on the International Temperature Scale; boiling point, 2,152° C.; electrical resistivity, 1.66 ohm cm. The crystal form is face-centred cubic, with lattice constant $a=4.0779$, and an interatomic distance of 2.8835 Ångström units.

Ores and Sources

Silver occurs chiefly in nature as the sulphide Ag_2S , argentite, which is sometimes found alone in siliceous rocks, but is more commonly associated with the sulphides of the base metals, lead, copper, zinc, more rarely with tin and nickel, and with gold. It also occurs with arsenic and antimony in complex sulphides and as proustite and pyrrargite, and more rarely as the telluride, hessite. The most important source of high-grade silver ores, which account for only about 20 p.c. of the world's production, is Mexico; and even there complex ores are of increasing importance. Lead-zinc ores are the most important source, providing 45 p.c. of the world's output and occurring in many parts of the world, including Mexico, the U.S.A. (Utah

and Idaho), Peru (Cerro de Pasco), Bolivia, Canada (Cobalt dist., Ontario), and Australia (Broken Hill, N.S.W.). Copper and copper-nickel ores provide nearly 20 p.c. of the world's supply.

Methods of preliminary extraction vary widely and depend upon the composition of the ore deposit. Straight silver ores are commonly treated by direct cyanidation, the coarsely crushed ore being further ground wet in cyanide solution. After transfer to large agitators or tanks, further cyanide solution is added and agitation with air is carried out for several days. After filtering, the silver is precipitated with zinc dust, filtered off, and smelted to give crude silver.

Methods of Extraction

Many lead ores contain appreciable amounts of silver, and when these are smelted the lead acts as a collector for the silver. Smelting is often preceded by concentration of the lead-silver minerals by selective flotation, and then smelting in blast furnaces gives an argentiferous lead, from which the silver may be removed by one of three processes.

The first, the Parkes process, depends upon the fact that silver has a greater affinity for zinc than for lead and thus, when zinc is added to the molten argentiferous lead in a large kettle, a zinc-silver crust is formed. This crust is scraped off and further zinc is added, the process being repeated until nearly all the silver has been removed from the lead. The kettle is then cooled until the lead is just above its freezing point, when the remaining zinc-silver compound floats to the surface, leaving silver-free lead. The skimmings are then pressed into blocks, placed in retorts, and the zinc is distilled off and collected for use again, the residue being cupelled to recover the silver. This process has been improved on in certain plants by making it continuous, a bottle-shaped kettle being used. The incoming argentiferous lead is poured through a thick zinc crust, which collects the silver as the lead falls through it. The zinc is removed and renewed periodically and the purified lead is removed continuously from the bottom by a siphon pipe.

The Pattinson process, which involves cooling the silver-rich lead until the higher-melting pure lead crystallises, leaving a silver-rich liquid alloy and scraping these crystals from the bottom of the furnace, is still used.

The third method, the Betts process, is the electrolytic refining process for lead, the silver and other precious metals being collected in the anode slimes. The electrolysis is carried out in asphalt-lined vats with a solution of lead fluosilicate and free hydrofluosilicic acid. The slimes are removed periodically, dried and cupelled, to give a crude silver bullion. Silver is removed from copper and copper-nickel ores in similar fashion, as it accompanies the copper throughout concentration and smelting operations, finally finishing in the crude copper or nickel. Fire refining does not remove the silver, but if it is there in appreciable amounts its recovery will more than pay for the cost of electrolytic refining of the copper and nickel, silver and the precious metals being concentrated in the anode slimes as in the Betts process.

The impure metal may contain anything between 50 and 95 p.c. of silver; and secondary scrap silver, obtained from either industry, jewelry, or coinage, may be treated in the same way. Preliminary purification is effected by cupellation, which involves melting down the bullion with lead and blowing air through the melt, so that the base metals become fully oxidised and dissolve in the low-melting lead oxide formed, which is removed from the top of the bath. This may give sufficient refining for some purposes, but gold and the precious metals remain with the silver and the product is usually treated electrolytically. The partially refined silver is cast into anodes, which are electrolysed in an aqueous solution of silver nitrate, containing free nitric acid. Careful control is needed to avoid co-deposition of the copper usually present in crude silver.

In the Moebius cell, the cathode is either stainless steel or a thin sheet of pure silver and the crude silver anodes are enclosed in linen bags. The silver is deposited on the cathode as crystals, which are continuously scraped off by wooden scrapers. The crystals fall to the bottom of the cell, whence they are collected, washed, melted, and cast into ingots of more than 99.95 p.c. purity. In the Balbach type of cell the anodes are held horizontal in trays with a bottom of supported filter cloth. The bottom of the tank is made of graphite, which acts as a cathode, from which the loose silver crystals are removed periodically. In both

processes the anode slimes, collected in the bags or trays, are treated for recovery of gold and the platinum metals.

Pure silver is a white and ductile metal, capable of taking a very high polish and the annealed metal is the best conductor of electricity known. It may be readily fabricated and worked, cold work slightly lowering its conductivity. Mechanically, silver and its principal alloys do not show exceptional strength or hardness, but its high electrical and thermal conductivity, optical reflectivity, and resistance to oxidation and corrosion by many chemicals commonly used in industry, give it wide, if specialised, application in the chemical and engineering industries. It has an ultimate tensile strength of 9 tons per sq. in. in the annealed state, but this may be raised to about 20 tons per sq. in. by cold work; and in the same way the Vickers hardness may be increased from 26 to nearly 100. It is not attacked by solutions of the alkalis, nor by fused alkalis up to fairly high temperatures, and it resists attack by most organic acids. Hot, strong sulphuric acid and nitric acid of any strength will dissolve it readily, but dilute sulphuric or phosphoric acids do not affect it. Hydrochloric and the other halogen acids form a protective film, which is dissolved away only by the strong acid, so that dilute acids do not dissolve it. Oxygen will not affect it even at high temperatures, though silver dissolves appreciable quantities of oxygen in the molten state. Sulphur and its compounds attack it readily, causing yellow or black stains of sulphide.

Uses of Silver

Apart from its well-known use for the manufacture of silver ornaments and tableware and for silver plate, silver has so many engineering applications that it is impossible to detail them here. In the electrical industry its high conductivity causes silver and silver-copper alloys to be used for numerous contacts, switches, commutators, fuses, and various small parts in electronic apparatus. There are instances of hundreds of tons of pure silver being used as bus-bars in aluminium reduction works. For chemical engineering plant it is used chiefly for constructing or lining stills, pans, and vessels where its high thermal conductivity and resistance to corrosion are assets. Silver alloys are commonly used for low temperature brazing, and aluminium

alloys, containing up to 10 p.c. of silver, have been used for scientific instruments. Silver-lined bearings are used for aircraft engines and various other rapidly moving parts. Gold, copper, and palladium are sometimes added to silver to make industrial alloys with greater strength and hardness. The most common use of silver compounds is in the photographic industry, where large amounts of silver chloride and bromide are used in the manufacture of all light-sensitive materials, films, plates, etc.

Its history goes back a very long way, but it is not certain when silver was first extracted metallurgically from its ores, although it was probably after gold and copper. It is thought that silver was extracted by cupellation before 1500 B.C. from lead-silver ores in Babylonia, while references in literature and relics show that the Mycenaeans first and later the Phoenicians and Greeks were well versed in silver metallurgy and commonly worked with silver for ornaments. In the Old Testament Jeremiah refers to the extraction of silver before 600 B.C. and the Romans extracted silver from various localities in Great Britain, notable the Mendips, Derbyshire, and Shropshire. Silver has always been much coveted and, as with gold, its history is rather clouded by international politics, particularly in the Middle Ages. See Bimetallism; Coinage; Cupola; Cyaniding; Electro-Plating; Photography; Silversmith.

Silver, LONG JOHN. Character in Stevenson's Treasure Island. A plausible, but black-hearted and murderous old pirate, with only one leg, he secures an engagement as cook to the search expedition in order to lead a mutiny at the fitting opportunity and secure the treasure. On the stage the part was memorably played by Arthur Bourchier and on the screen by Wallace Beery and Robert Newton.

Silver Fir (*Abies pectinata*). Tall evergreen tree of the family Pinaceae. A native of Central and Southern Europe, it attains a height of 150 ft. or more, and a trunk diameter of upwards of six feet. During its youth, say up to 50-100 years old, its bark remains smooth, but later it breaks into small, thin scales. The needles are not in pairs as in the pines, but solitary, arranged in spirals. These are clearly seen on upright shoots, but on the lateral shoots the needles appear as in two ranks only. They are bright green and polished on

the upper side, but beneath there is a stripe of white wax on each side of the mid-rib, which gives the tree



Silver Fir. Male flowers of the evergreen tree

its popular name. Each leaf endures for eight or more years. The cones are cylindrical, erect, and about 6 ins. long. Between the scales are long bracts whose points protrude and turn down, giving the cone a prickly appearance. Fertile seeds are produced when the tree is about 40 years old. The timber, though soft, is strong. It is enduring for interior work, but does not stand exposure to the weather. It yields Strasbourg turpentine.

Silver Fish (*Lepisma saccharina*). Wingless insect of the order Thysanura. About $\frac{1}{4}$ inch long, it has a silvery sheen from its covering of glistening scales. It is found in domestic kitchens and cupboards where, owing to its fondness for sugars and starchy material, it may cause some harm if abundant. The closely related fire brat (*Thermobia domestica*) is found in bakehouses, etc.

Silver Jubilee. Name given to the celebration of a 25th anniversary. It was particularly applied to the celebrations in connexion with the completion by George V of 25 years on the British throne, May 6, 1935. The chief official event of the day was the morning processional drive of the king and queen to St. Paul's cathedral for a thanksgiving service. In the evening the king broadcast to all his peoples, and on many days following he and the queen made tours of London, being received everywhere with great enthusiasm. The day, which was made a public holiday, was marked by the customary signs of jubilation, decorations and illuminations, fireworks and feasting. But more impressive was the spontaneous demonstration from British people everywhere of sincere affection for the king and queen.

Silver King, THE. Melodrama by Henry Arthur Jones and Henry Herman. Produced, Nov. 16, 1882, at the Princess's Theatre, London, it had a run of 289 performances. The hero, Wilfrid Denver, thinking he has killed a man, flies to America. Having made a fortune in silver mines there, he returns to England and discovers the murderers. Wilson Barrett toured the world as Denver.

Silver Leaf. Fungus disease of plum trees, especially Victoria plum, recognized by the silver-grey colour it imparts to the leaves. It is believed to be due to ill-drained soil. The law demands that any branches affected must at once be cut off and burnt, as the spores spread rapidly.

Silversmith. One who works in silver. Vessels and ornaments of silver were common in ancient Egypt, and are frequently mentioned in Homer; the Bible contains many references throughout the O.T. to the use of silver for cups, bowls, candlesticks, images, etc., while the craft of the silversmiths of Ephesus is noticed in the story of Demetrius (Acts 19).

In western Europe the Renaissance period produced many fine craftsmen in gold and silver, among whom Benvenuto Cellini (*q.v.*) was conspicuous. In England, silver early came into domestic use among the wealthy classes, its place in the lower social scale being taken by pewter. Since 1300 the quality of English silver plate has been guaranteed by assay. This right was then granted by Edward I to the Guild of Goldsmiths of London, under condition that "no vessels of gold or silver should leave the maker's hands until they had been tested by the wardens and stamped with the leopard's head." This mark was known as the king's mark; it is now known as the town mark for London. Thus began the compulsory marking of gold and silver wares.

The standard of silver has from time immemorial been "sterling," first mentioned in the enactment of 1300. The alloy consists of 11 ozs. 2 dwts. of fine silver to 18 dwts. of base metal in 1 lb. troy.

In 1697, however, a higher standard known as the new sterling was substituted to prevent the melting of coins of the realm restored by Queen Elizabeth to sterling standard. Silver of the new standard was marked with the lion's head erased and the figure of Britannia. The alloy consisted of 10 dwts. only of base metal in

every pound troy. In 1720 the old sterling standard was restored, but the new sterling standard is still authorised and indicated by the marks prescribed in 1697.

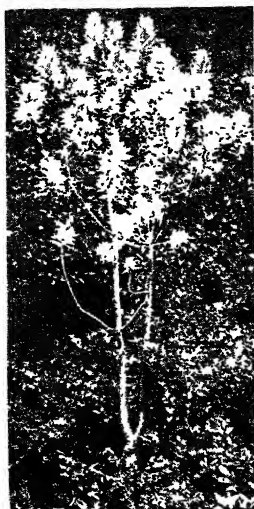
In the provinces local assay offices were established at Bristol, Exeter, Newcastle, Norwich, and York, but these have all ceased to exist. Six assay offices now operate at the present time (town marks shown in brackets): London (leopard's head), Chester (three wheat sheaves and sword), Birmingham (anchor), Sheffield (crown), Edinburgh (three-towered castle), and Glasgow (tree, bird, bell, fish, and ring).

Modern wares of gold and silver are varied in character, and include domestic and ecclesiastical plate, jewelry, mounts for two non-metallic articles, etc.

There are three methods of manufacture: (1) hammering by hand from sheet metal; (2) spinning on a lathe from sheet metal; (3) casting by pouring molten metal into a mould. The first method produces "wrought plate" which includes most of the finest work by artist craftsmen; but some fine pieces have been produced by casting. See Goldsmith; Hall Mark; Plate; Sheffield Plate; consult also The Silver and Sheffield Plate Collector, W. A. Young, 1919; English Domestic Silver, C. C. Oman, 2nd edn. 1947.

Silverstone. British motor racing track, near Towcester, Northants. Adapted from a war time airfield, it was opened 1948, and here were run the first British Grand Prix (300 m.), 1949, and the 1950 Grand Prix d'Europe (210 m.), the first to be held in the U.K. The length of the circuit is varied by including all or part of the former airfield's perimeter and runways. The Grands Prix laps are about 3 m. in length. There is also an annual race of approx. 50 m. for 500 c.c. cars. The full course is a right-hand (clockwise) circuit, with five corners and three curves.

Silvertown. Dist. of Greater London, within the borough of West Ham. It lies to the W. of N. Woolwich, S. of the Royal



Silver Tree. Silvery-leaved tree, native of the Cape of Good Hope

Albert Dock, 8 m. E. of Liverpool Street by rly. By a fire and explosion at a munitions factory here, Jan. 19, 1917, 69 persons were killed and 400 injured.

Silver Tree or **WITTEBOOM** (Du., white tree) (*Leucadendron argenteum*). Small tree of the family Proteaceae. It is a native of the Cape of Good Hope. The long, slender, lance-shaped, leathery leaves are covered with silvery white hairs and are exported in quantity for wreath-making with "everlasting" flowers, for which their durability

makes them suitable.

Silver Wedding. The 25th anniversary of a wedding. For other wedding anniversaries, see under Golden Wedding.

Silvia. Character in Shakespeare's *The Two Gentlemen of Verona* (q.v.). She is beloved by both Valentine and his friend Proteus, but is given in marriage by her father, the duke of Milan, to Valentine. A song occurring in the play, *Who is Silvia?* is well known in a setting by Schubert.

Simancas (Lat. *Septimanca*). Town of Spain. It stands on the Pisuerga river, in the prov., and 7 m. by road S.W., of Valladolid. The surrounding plain yields cereals, fruits, and wine. It was formerly enclosed by a wall, parts of which remain. The fine bridge was a Roman structure. Here, in 934, a battle was fought between the Christians and the Moors.

Simancas is chiefly known for its rich store of documents dealing with the history of Spain. Its Moorish citadel was selected by the emperor Charles V as a storehouse for these, and others were added by Philip II and other sovereigns. It is estimated that the collection consists now of 33,000,000 documents. Pop. 1,200.

Simarubaceae. Small family of trees and shrubs. They are natives of the tropics and warm regions, and include the *Quassia* genus. They have, mostly, alternate leaves and small regular flowers in spikes. The bark of many species is very bitter and, as that of bitterwood (*Simaruba*), yields drugs. In *Quassia* (q.v.) and

Picraena the wood is also used. Other genera are *Brucea*, *Ailanthus*, and *Simaba*.

Simcoe. Lake and town of Ontario, Canada. The lake lies in the S. part of the prov. in the narrow strip between Lakes Erie and Huron, the Severn taking its waters into Georgian Bay. Its area is 271 sq. m. The surrounding dist. was the scene of an Indian war, during which the Iroquois almost exterminated the Hurons. The town is 24 m. from Brantford, is the capital of Norfolk co., and is served by the Canadian National and Wabash rlys. Pop. 6,037.

Simcoe, JOHN GRAVES (1752-1806). British soldier and administrator. Born at Cotterstock, in Northumberland, Feb. 25, 1752, he was educated at Eton and Merton College, Oxford. For about six years (1775-81) he served in the American War of Independence. In 1790 he became M.P. for St. Mawes and almost at once was chosen as governor of the new province of Upper Canada. He remained there for four years, but quarrelled with the governor-general, Lord Dorchester. After returning to England, Simcoe commanded the troops at Plymouth, and had just been appointed commander-in-chief in India when he died at Exeter, Oct. 26, 1806. See Life, D. C. Scott, 1905.

Simenon, GEORGES (b. 1903). Belgian novelist. Born at Liège, he became known by a series of novels which although written with ease and rapidity show unusual insight into the minds of abnormal and criminal personalities, as well as into the atmosphere of various countries and districts. His stories introducing the detective Maigret were translated into many languages. He emigrated to the U.S.A. shortly before the Second Great War.

Simeon. Name of one of the tribes of Israel, and of its traditional ancestor, the second son of Jacob and Leah. He was born at Haran in Mesopotamia, and with Levi took part in the slaughter of the Shechemites for the wrong done to his sister Dinah. This may represent an early feud with Shechem, resulting in the dispersion of the two tribes. The remnant of Simeon settled in the S. part of Judah, and seems to have been a pastoral people which was soon absorbed by Judah.

Another Biblical Simeon was the "just and devout" man to whom the promise had been made that he should not die until he had seen the Christ (Luke 2).

After seeing the infant Christ in the temple, he spoke what is called Nunc Dimittis (Lord, now lettest thou thy servant depart in peace, etc.), familiar as one of the ancient hymns of the Christian Church.

Simeon II (b. 1937). Last tsar of Bulgaria. Born June 16, 1937, he succeeded to the throne at the age of 6, on the death of his father Boris III, Aug. 28, 1943, the proclamation of his accession referring to him as "the darling and hope of our country." But his reign was short. The regency council appointed to act for him fell within a year. Bulgaria became a republic Sept. 15, 1946, and Simeon left with his mother, Joanna, daughter of Victor Emmanuel of Italy, to join the latter in Egypt.

Simeon, CHARLES (1759-1836). British divine. Born at Reading, Sept. 24, 1759, he was educated at

Eton and King's College, Cambridge. Elected fellow of King's, he was ordained, and in 1783 became perpetual curate of Holy Trinity, Cambridge, where

he remained until his death. Simeon exercised an enormous influence in the university, and was one of the leaders of the evangelical party in the Church of England. He helped to found the Church Missionary Society and established the Simeon Trust to secure livings in the Church of England for men holding evangelical opinions. He died Nov. 13, 1836.

Simeon OF DURHAM. English historian. A monk of Jarrow, he lived from about 1070 to 1130. He is known for two works which are authorities for the history of England in the 11th and 12th centuries. The first is a history of the church of Durham, valuable for its account of affairs in the north of England; and the second a History of England, the earlier parts of which are copied from other writers. An English translation appears in Church Historians of England, J. Stevenson, 1855.

Simeon Stylites (350-459). Pillar-saint. Son of a shepherd in Cilicia, he entered a local monastery at the age of 13, and two years later removed to another monastery under the abbot Heliodorus, where he practised extraordinary austerities. Later he lived as a

hermit on Mt. Thelaniisa, near Antioch, where in 423 he built a series of pillars, on which he spent over 30 years of his life. He was visited by great crowds, to whom he preached. He was buried at Antioch. See Anchorite; Monasticism; Pillar. *Pron.* Sty-li-teez.

Simferopol. Town of the R.S.F.S.R., in the Crimea, and the capital of that region. It is about 50 m. N.E. of Sevastopol, on the river Salghir and the Kursk-Sevastopol rly. Notable edifices are the Alexander Nevski cathedral and the Zemstvo building. There are soap, candle, and tobacco factories, and much fruit is exported. Simferopol was formerly a Tartar village. German forces captured Simferopol Nov. 1, 1941, during their advance on Sevastopol. The town was liberated April 13, 1944, by troops of the 4th Ukrainian army. Pop. 142,678.

Simile (Lat., like). Figure of speech by which a thing, scene, or event is compared with another which in some way resembles it. In poetry and rhetorical prose, the simile aims at the imaginative suggestion of a quality by a not too obvious analogy. It may be expanded to considerable length, details being introduced for the sake of ornament which are not relevant to the comparison. Elaborate similes of this kind are frequent in Homer, and in the epic tradition derived from him. They are very rare in the old English and other Teutonic literatures. See Metaphor. *Pron.* simmy-lee.

Simla. District of Punjab state, India, in the Ambala division. It is situated among the hills, and comprises the great hill station of Simla and many detached areas. The chief crop is wheat. Its area is 180 sq. m. Pop. 38,576. See Simla Hill States.

Simla. Town of Punjab state, India. It stands on a ridge 7,500 ft. above sea level in the Himalayas, 170 m. N. of Delhi, with which it is connected by rly. through Ambala and Kalka, whence (2,100 ft.) a 60 m. hill rly. including 107 tunnels, opened 1903, runs to Simla at a point 7,000 ft. high. The cart road from Kalka to Simla has been converted into a motor road.

Known locally as Shumlah, Simla originally belonged to the maharaja of Patiala and the rana Keonthal, but was acquired by the British govt. in 1830 as a summer resort. It was made the summer capital of India in 1864, and of the Punjab in 1876. Although plans were made for laying out the town in worthy fashion, including the building of a town hall and the construction of circular motor roads, they were never carried out and the town grew haphazardly as a mixture of government buildings, bazaar tenements, and picturesque bungalows, along with more handsome edifices, such as Christ Church, the telegraph office, and the legislative buildings. Motor-cars were prohibited except for those of the viceroy, the commander-in-chief, and the governor of the Punjab. An exception was made in favour of Gandhi, during Lord Irwin's viceroyalty. The drabness of the town is mitigated by the glory of deodars, the rhododendrons, dahlias, and cosmos on the mountain roadsides, and the splendour of the distant snows. The highest hill in Simla is Jakko (8,048 ft.), on the summit of which is the temple to Hanuman (the monkey-god), brown monkeys living there in great number. Pop. (winter) 25,000, (summer) 92,000.

Simla Hill States. Group of small states in the Punjab, India.



Charles Simeon,
British divine



Simla, Punjab. General view of the summer capital of India

In 1948 they were merged, with other Punjab Hill states, in the Punjab Hill states union, known as the Himachal union, administered by the govt. of India through a chief commissioner. The major states were Jubbhal, Bashahr, Keonthal, and Baghal; the minor states numbered 17, varying in area from the smallest, Bija, 4 sq. m., to Bhajji, 96 sq. m. Wheat and pulses are the chief crops of the region. The chiefs of these states were Rajputs. Area, 5,937 sq. m. Pop. 460,000.

Simnel, Lambert (c. 1475-1535). English impostor. Said to be the son of an Oxford joiner, he was a handsome youth with a certain natural dignity. An ambitious priest, Richard Simon, trained him to play his part as the figure-head in a Yorkist plot against Henry VII (*q.v.*). The opportunity was provided in 1486 by a report that the earl of Warwick, son of the deceased duke of Clarence, and Yorkist claimant to the throne, had escaped from the Tower. Although the government produced Warwick, Simnel was taken to Ireland and crowned as Edward VI in Dublin cathedral. With the support of Margaret of Burgundy, the earl of Lincoln, other powerful Yorkist nobles, and an army of Irishmen and German mercenaries, the rebellion was carried over to England. Simnel landed near Furness, and marched through Yorkshire, but was overthrown by Henry VII at the battle of Stoke, near Newark, June 16, 1487. The earl of Lincoln was killed, and Lambert Simnel was relegated to service in the royal kitchens.

Simnel Cake (Lat. *simila*, wheat flour). Rich cake, formerly made to celebrate Mothering Sunday, the 4th Sunday in Lent. The ingredients are those of a rich plum pudding, enclosed in a crust coloured with saffron. The cake is boiled for several hours, then brushed with egg and baked. The making of simnel cakes, formerly common in W. England, is still observed when circumstances permit in a few localities of Gloucestershire and Monmouthshire, and in Lancashire, where the rich plum cake is surmounted by a layer of almond paste.

Simois. Small river of the Troad, Asia Minor. Often mentioned in the Iliad, it was a tributary of the Scamander. It has been identified with the Dumbrek Chai, but this insignificant stream does not bear out the description in Homer. It may be another name

for the Scamander, or an invention of the poet. Simois was also personified as a river god, the son of Oceanus and Tethys.

Simon, John Allsebrook SIMON, 1ST VISCOUNT (b. 1873). British politician and lawyer.



1st Viscount Simon,
British politician

Born Feb. 28, 1873, the son of a Congregational minister, he was educated at Fettes and Wadham College, Oxford, and was called to the bar in 1899. He represented the British govt. on the arbitration over the boundary of Alaska, 1903, and became a K.C. 1908. As leading counsel, by his great grasp of principle and detail, and the deadly efficiency of his cross-examination, he became the outstanding figure in numerous civil and arbitration cases. From 1906 to 1918 he was Liberal M.P. for Walthamstow, being appointed solicitor-gen. in 1910 and receiving a knighthood. In 1913 he was promoted to attorney-gen., with a seat in the cabinet. In the Asquith coalition govt. of 1915 he became Home secretary, but resigned office in 1916 in disagreement with the principle of compulsory military service. Losing his seat in 1918, he did not return to parliament until elected in 1922 as Independent (Asquithian) Liberal for Spen Valley, Yorks, a seat he retained until he was elevated to the peerage in 1940.

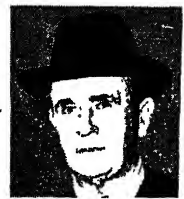
In the General Strike of 1926 his speech defining the legal position of the strikers was held to have been an important contribution to the collapse of the strike. In 1927-28 he was in India acting as chairman of the statutory commission to inquire into the Indian constitution. In MacDonald's national govt. of 1931 Simon returned to office as foreign secretary. Over the issue of free trade and the Ottawa agreements the Liberal party was split into two factions, the Lib. Nationals, led by Sir H. Samuel, who broke away from the govt., and the National Libs. led by Simon, who supported it. Simon thus remained at the foreign office as leader of the Liberal remnant in the govt., being transferred to the Home office in 1935, and to the chancellorship of the exchequer in 1937. From 1935 to 1940 he was deputy leader of the commons. In the Churchill

govt. of 1940 he became lord chancellor, and was created 1st Viscount Simon of Stackpole Elidor. Continuing as lord chancellor in the Churchill "caretaker" govt. of 1945, to which he gave full support, he went out of office with the defeat of that govt. the same year.

As foreign secretary Simon endeavoured, with varying success, to steer a middle course in European politics. In the public mind his name became identified first with his support, while acting as British council member of the League of Nations assembly, 1933-34, of the Lytton report on Japanese aggression in Manchuria; secondly with his consistent support of Chamberlain's policy of appeasement towards the Italian and German dictators.

Among Lord Simon's publications is a very moving Portrait of My Mother, published 1936.

Simon of Wythenshawe, ERNEST DARWIN SIMON, 1ST BARON (b. 1879). British politician



Lord Simon of
Wythenshawe,
British administrator

and was a member of the Manchester city council 1911-25, acting as lord mayor 1921-22, and as chairman of the housing committee 1919-23. During 1923-24 and again during 1929-31, he was Liberal M.P. for Withington, Manchester, being appointed parl. sec. to the ministry of Health in 1931. He was knighted 1932, and became chairman of the council of Manchester university. Joining the Labour party in 1946, he was appointed in June, 1947, chairman of the board of governors of the B.B.C. In the same year he was raised to the peerage. Lord Simon published many books on housing problems.

Simon, Sir John (1816-1904). British surgeon. Born Oct. 10, 1816, and trained at S. Thomas's Hospital, where he became surgeon and lecturer on pathology, 1847, he early devoted himself to surgical questions and sanitary reform. Simon was appointed medical officer to the local government board, 1855-76. During these years he developed his theories of sanitary science, and saw them

successfully put into practice and widely copied in other countries. Created K.C.B. in 1887, he died July 23, 1904. He wrote many books, including *General Pathology*, 1852; *Reports relating to the Sanitary Condition of the City of London*, 1854; *Fifth Diseases and their Prevention*, 1876; and *Public Health report*, 1887.

Simon, RICHARD (1638–1712). French Biblical critic. He was born at Dieppe, May 13, 1638, became a priest of the Oratory in 1670, and was mainly employed with library work in Paris. The publication of his *Critical History of the O.T.* in 1678, which has been called the birth of the Higher Criticism, ended his career as an Oratorian, and he retired to parish work in Belleville. He also wrote a *Critical History of the Text of the N.T.* Simon died at Dieppe, April 11, 1712.

Simonides or **SEMONIDES** (c. 650–600 B.C.). Greek iambic poet. A native of Samos, he led a colony to the island of Amorgos, one of the Cyclades. His work on the antiquities of Samos is lost, but among the fragments of his iambs is the satire on women, in which he attributes their characteristics to the animals from which they are supposed to be descended, e.g. the crafty woman from the fox, and the industrious housewife from the bee. Simonides did not, like Archilochus (q.v.), attack individuals, but whole classes. *Pron.* Sy-monny-deez.

Simonides (c. 556–468 B.C.). Greek lyric poet. He was born in the Ionian island of Ceos, but spent most of his life at Athens, in Thessaly, and at the court of the tyrant Hiero in Sicily, where he died. He wrote both in the Doric and Ionic dialects and was the author of hymns to the gods, odes, elegies, dirges, epitaphs, and epigrams. His first efforts were the elegiac epitaphs which he composed in honour of the Athenians who fell in the Persian wars; in 489 B.C. he beat Aeschylus in competition for the best elegy on those who fell at Marathon. His poetry survives only in fragments. One is a piece of exquisite beauty and tenderness describing Danaë with the baby Perseus when her father had sent them adrift on the stormy sea. Simonides shares with Pindar the distinction of being the greatest lyric poet of Greece. He was the first Greek poet to write for money.

Simon Magus (fl. c. A.D. 37). Samaritan magician (Gr. *magos*) and religious leader. Acts 8, vv. 9–24 relates that his followers regarded

him as “that Power of God which is called Great.” Baptized by the deacon Philip, he desired to acquire the miraculous gifts of the Holy Spirit possessed by SS. Peter and John, and offered them money, but was sternly rebuked by S. Peter (see *Simony*). Justin, himself a Samaritan, states that Simon of Gitta, in Samaria, whose identity with Simon Magus is disputed by some, founded a numerous sect which worshipped him as “the first God,” and that after his visit to Rome divine honours were paid him there. Justin appears to have confused him with the old Sabine god, Semo Sancus. In later legends marvellous tales are told about Simon Magus. The Simonite sect blended pagan and Christian doctrines with a form of Gnosticism.

Simonstown. Naval port of S. Africa. It is situated on an arm of False Bay, on the E. side of

sirocco wind originating in Arabia, chiefly during the late spring and autumn months, and penetrating into Palestine and Syria as a S.E. or E. wind. In the Sahara the name is also applied to a whirlwind which advances and raises great volumes of sand, sometimes overwhelming caravans and suffocating both men and camels; it resembles the haboob of the Sudan.

Simplicissimus. Former German satirical weekly periodical, published in Munich. Founded 1896, it soon became internationally famous for the caricatures of T. T. Heine and Otto Gulbransson, and for its constant ridicule of authority, a ridicule that was long maintained in the face of many prosecutions. It was suppressed by the Nazis in 1942. The name was taken from that of the hero of a 17th cent. German



Simonstown, S. Africa. Simon's Bay and the Admiralty harbour with enlarged docks, opened in 1910, capable of berthing the largest warships

the Cape peninsula, 22 m. by rail from Cape Town. It was founded in 1814, although first occupied by the British in 1795. It is the southern hemisphere's most important strategic naval base. New docks and other extensive harbour works date from 1900. The town is the h.q. of the S. African training ship, the *General Botha*. The southern end of the town has become a popular seaside resort, with golf links and good bathing. The church of S. Francis, 1834, is the oldest English church in S. Africa. The resident European pop. numbers 1,999.

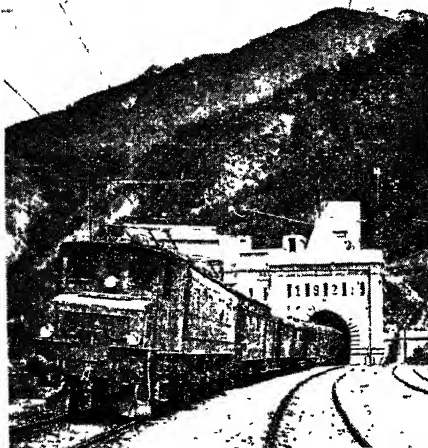
Simony. Term of ecclesiastical law. It takes its name from Simon Magus. By ecclesiastical law it was simony to agree corruptly to present anyone to any ecclesiastical preferment for reward. By the law of England a simoniacal contract is void; but a patron may present a clerk to a living and make a stipulation that he resigns in favour of one of the patron's relations if requested to do so. *See* Benefice.

Simoom (Arab. *samum*, from *samma*, be poisoned). Stifling hot, dry and often dust laden

story by Grimmelshausen, dealing with the Thirty Years War. A similar paper was pub. from 1946 under the name of *Simpl.*

Simplon. Alpine pass in Switzerland. It leads from Brieg in canton Valais to Domodossola in Piedmont, Italy, at an alt. of 6,582 ft. The Simplon Road was begun under Napoleon in 1800, and finished in 1805. It is 42 m. long, 25 to 30 ft. broad, and has 611 bridges, as well as numerous galleries and tunnels. A hospice founded by Napoleon and a summer hotel mark the summit. Below the pass, at its highest only 2,312 ft. alt., is the 12½ m. rly. tunnel which joins Brieg and Isella on the route to Milan. This was opened May 19, 1906. A second tunnel was completed in 1921. *See* illus. p. 7574.

Simpson, SIR GEORGE CLARKE (b. 1878). British meteorologist. Born in Derby, Sept. 2, 1878, he was educated at Victoria university, Manchester, and Göttingen. As an 1851 exhibition scholar he was the first to study the electrical state of the atmosphere within the polar circle (Lapland). In 1906 he was appointed to the



Simplon. Swiss entrance, at Brieg, to the 12½ mile railway tunnel leading into Italy. See page 7573

India meteorological dept. and, in 1910, joined Scott's second expedition to the Antarctic, later publishing the meteorological results of the expedition. He was attached to the B.E.F. in Mesopotamia, 1916, acted as asst. secretary of the India munitions board, 1917-19, and served on the Nile projects commission, 1920, in which year he was appointed director of the British meteorological office, retiring in 1938. He became F.R.S., 1915, and was corresponding member of the academies of science of Prussia and Vienna. He was created K.C.B. in 1935. During the Second Great War he acted as superintendent of Kew observatory and, 1940-41, as president of the Royal Meteorological Society. Renowned for his pioneer work in atmospheric electricity, having first advanced his breaking-drop theory of the origin of electricity in thunderstorms in 1909, he also reached important conclusions about terrestrial radiation, ice ages, and the causes of climatic change.

Simpson, Sir James Young (1811-70). Scottish physician. Born in Linlithgow, June 7, 1811, the son of a baker, he was educated at



Sir James Simpson,
Scottish physician

Edinburgh university, where, having taken his medical degree, he became a lecturer. In 1840 he was chosen professor of medicine there. Simp-

son's chief title to fame is the work he did in forwarding the use of anaesthetics, of which he may be regarded as the founder. He was made a baronet in 1866, and died May 6, 1870.

His son, Sir Walter Grindlay Simpson (d. 1898), who succeeded to the baronetcy, is Stevenson's companion in *An Inland Voyage* (q.v.). See *Anaesthesia*; consult also *Life*, E. B. Simpson, 1896; Simpson and Chloroform, H. L. Gordon, 1897.

Simpson, Sir John William (1858-1933). British architect. Born at Brighton, Aug. 9, 1858, he was already an architect of repute when in 1910 he went into partnership with Maxwell Ayrton. Responsible for the schools at Haileybury, Lancing, and Roedean, the Glasgow art galleries and many other public buildings, he achieved his most notable work as chief architect, with his partner, of the British Empire Exhibition at Wembley, 1924.

Simpson, Patrick Carnegie (1865-1947). British divine. Educated at George Watson's school, Edinburgh, and at Edinburgh university, he was minister of the U.F.C. of Scotland at Renfield, then of the English Presbyterian church at Egremont, Ches, before being appointed professor of Church history at Westminster theological college in 1914. He retired in 1938. In both 1926 and 1927 he was elected moderator of the federal council of the English free churches, and in 1928 served as moderator of the general assembly of the Presbyterian Church of England. He published many books on Church principles, as well as devotional works. His *Recollections* were pub. 1943. He died Dec. 22, 1947. Dr. Simpson wrote for this work the article on Protestantism and many shorter entries dealing with Church history.

Simpson, Bessie Wallis. Name of the duchess of Windsor while wife to Ernest Simpson, before her marriage in 1937 to the duke of Windsor (q.v.). It was as Mrs. Simpson that she first became acquainted with the duke (then prince of Wales) and that the British public generally became aware of her existence, during the duke's brief reign as Edward VIII.

Simrock, Karl Joseph (1802-76). German poet and scholar. Born at Bonn, August 28, 1802,



Karl Simrock,
German poet

and educated there and in Berlin, he entered the Prussian civil service in 1826, but was dismissed in 1830 for having written a poem in praise of freedom.

He issued a succession of modernised works of ancient writers, among them the *Nibelungenlied*, 1827; *Walther von der Vogelweide's Poems*, 1833; *Reineke Fuchs*, 1845; also the *Eddas*, 1851; and *Beowulf*, 1859. He collected old German hero-legends in the *Heldenbuch*, 1843-49; published a volume of his own poems, 1844; and made translations from Shakespeare and the early Italian novelists. His translation of the *Nibelungenlied* is recognized as a classic. He died July 18, 1876.

Sims, George Robert (1847-1922). British journalist and playwright. Born Sept. 2, 1847, and educated at Eastbourne, Hanwell College, and Bonn, Germany, he was widely known by his pen-name of Dagonet, over which he contributed the *Mustard and Cress* columns to *The Referee*. In addition to an anonymous translation of Balzac's *Contes Drôlatiques*, and a volume of reminiscences, *My Life*, 1916, he was the author of *How the Poor Live*, *The Dagonet Ballads*, *Ballads of Babylon*, *Three Brass Balls*, *Among My Autographs*, *Without the Limelight*, *Watches of the Night*.

Sims was also author or part author of innumerable melodramas, farces, comedies, burlesques, and other stage productions, including *Lights o' London*, *In the Ranks*, *The Harbour Lights*, *Faust Up-to-Date*, *Little Christopher Columbus*, *Two Little Vagabonds*. He died Sept. 4, 1922.

Sims, James Marion (1813-83). American gynaecologist. Born in South Carolina, and educated at Jefferson Medical College, Philadelphia, he took up the



George Robert Sims

Russell

study of gynaecology, establishing a private women's hospital, and was the first doctor to carry out successfully the operation of closing vesicovaginal fistulae, till then supposed incurable. Sims was undoubtedly one of the great surgeons of his generation, and brought new and successful methods into surgical science. He wrote a number of books, including *Silver Sutures in Surgery*, 1858; *The Discovery of Anaesthesia*, 1877.

Sims, WILLIAM SOWDEN (1858-1936). An American sailor. Born at Port Hope, Canada, Oct. 15, 1858, he entered the U.S. navy in 1879. After a distinguished naval career he became president of the U.S. naval war college, Newport, R.I. When the U.S.A. entered the First Great War in 1917 he was put in charge of all U.S. vessels in European waters, and in 1918 was made vice-admiral. Reappointed president of the college at Newport, he was more than once censured for outspoken criticisms of U.S. naval affairs. His book *The Victory at Sea*, 1920, won the Pulitzer prize as the best book of its year on American history.

Sims, WINFIELD SCOTT (1844-1918). American inventor. Born in New York, he became an electrical engineer, and was one of the first to use electricity for driving and directing torpedoes. He carried out a series of experiments on the use of wireless for directing purposes, especially in connexion with torpedoes. He died Jan. 7, 1918.

Simson, SIR HENRY JOHN FORBES (1872-1932). British obstetrician. Born in India, Dec. 12, 1872, he came to England as a boy and held important posts in Edinburgh and London, establishing a reputation as a brilliant obstetrician. Among his patients were Princess Mary, countess of Harewood, and Queen Elizabeth when duchess of York. He played a prime part in the founding of the British college of obstetrics and gynaecology. In 1925 he was knighted. His wife was the actress Lena Ashwell (*q.v.*). Simson died Sept. 13, 1932.

Sin. Theological term signifying an offence against God, or a breach of Divine law. What is known as vice in the realm of ethics, and as crime in the social organism, becomes sin when it is viewed in relationship to God.

Some conception of sin is found in every type of religion. In its lower phases, where religion is

mainly non-ethical, sin consists of some breach of ritual, or the doing of some action that is taboo. When religion becomes ethicised, sin is identified with transgression of the moral law which is held to embody the will of God.

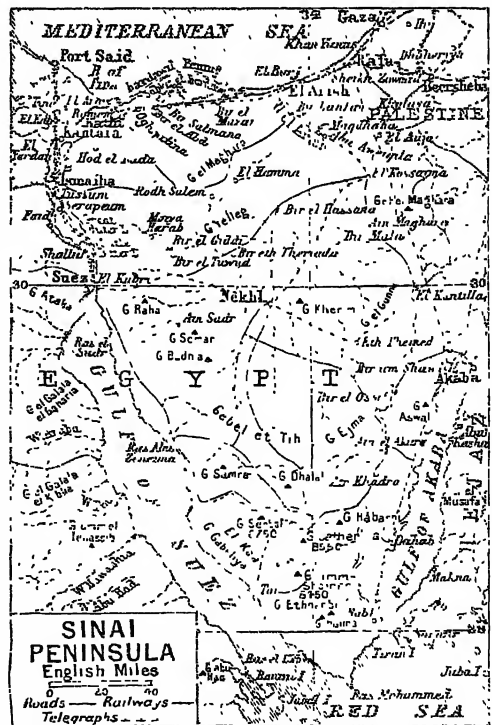
There has been much speculation among philosophers and theologians on the nature and origin of sin in man. Dualism in all its forms—especially in Parseeism and Manichaeism, and to a less extent in the Platonic and Neo-Platonic types of Greek philosophy—maintains that sin arises from the fleshly or material side of human nature; others, *e.g.* Origen in ancient times, and Spinoza in modern, hold that sin is of a purely negative character, and is simply the failure to attain to goodness. Leibniz argued that the presence of sin in man is due to "the imperfection necessarily inherent in finite things as such." "We must consider," he says, "that there is an original imperfection in the creature anterior to sin, because the creature is essentially limited; whence it comes that the creature cannot know everything, and can be mistaken and commit other faults." Kant, in his explanation, laid the stress on the will, and regards sin as the failure of the will to respond to the dictates of conscience.

Orthodox Christian theology has always found the origin of sin in the fall of Adam, though it has no clear explanation to offer of the cause of that fall. The sin of Adam involved the whole race in guilt, and made it impossible for any man to attain to the perfect life. This theory was elaborated first of all by Augustine, who was the first theologian to formulate the doctrine of original sin. Augustine was opposed by Pelagius, who argued that the

fall of Adam affected only himself, and that in the case of his descendants "every man was the Adam of his own soul." Another interesting theory finds the explanation of sin in a fall which took place in a state of pre-existence. Modern Christian thought is turning more and more to evolution, and to the facts of psychology in order to discover the nature and find the origin of sin. See Calvinism; Incarnation.

Sin OR NANNAR. Babylonian and Assyrian moon god. As parent of Shamash and Ishtar, his earlier supremacy was displaced by the sun god. His oldest seats were Ur and Harran. He was portrayed upon seal-cylinders about 2450 B.C., with flowing beard and crescent symbol.

Sinai. Egyptian peninsula at the head of the Red Sea. Between the Gulfs of Suez and Akaba, it is about 140 m. in length, and gradually tapers to a point at the S. end. It is largely a treeless region of wild and barren mountains, shut in on the N. by desert country. In the mountain-pass that forms the peninsula there are three principal peaks of considerable elevation—Gebel Catherina, 8,550 ft., Gebel-



Sinai. Map of the peninsula between the Gulf of Suez and the Gulf of Akaba

umm-Shomer, 8,450 ft., and Gebel Serbal, 6,750 ft. The Mount Sinai of the Old Testament has not definitely been identified, but is generally regarded as identical with Gebel Catherina, which has two separate peaks, Mount Horeb and Gebel Musa, or the Mountain of Moses, the latter usually regarded as the scene of the Hebrew law-giving. Politically, Sinai forms part of Egypt, and it is inhabited by scattered tribes of Beduins.

In the First Great War the British occupation of Sinai was a necessary preliminary to the attack on Palestine. At the beginning of 1916 the opposing Turks were in occupation of the whole peninsula, except for some stations on the Gulf of Suez. The British forces, under Sir A. Murray, gradually pushed rly. and pipe lines across the desert. There were battles at Katia and Romani (*q.v.*). In Nov., 1916, the British began systematic bombing from the air of Turkish lines of communication. The battle of Magdhaba (*q.v.*), Dec. 23, the occupation of El Arish (*q.v.*), and the final victory at Rafa, Jan. 9, 1917, were the chief incidents in the expulsion of Turkish forces from the peninsula.

Sinaia or **SINAJA**. Town of Rumania. Its monastery sheltered travellers across the Transylvanian Alps to and from Brasov (Kronstadt) before the rly. was built. On the Prahova, in N.W. Wallachia, Sinaia stands at the foot of the Tömös Pass, 70 m. N.N.W. of Bukarest. King Charles built a palace here in 1880, and later the town became a summer resort. It was occupied by the Austro-Germans in Dec., 1916. Pop. 3,906.

Sinaloa. Maritime state of Mexico. Bounded W. by the Pacific Ocean, it is traversed in the E. by the Sierra Madre Oriental range, and covers an area of 33,700 sq. m. Mining is the chief occupation, gold, silver, lead, iron, and copper being worked; other industries are agriculture and cattle rearing. The principal products are cotton, grain, sugar cane, rubber, and tobacco. Culiacan is the capital. Pop. 560,000.

Sinatra, **FRANK** (b. 1917). American singer. Born Dec. 13, 1917, at Hoboken, N.J., of Italian parentage, he rose from delivery boy to sports reporter on a N.Y. newspaper, then, in emulation of Bing Crosby, turned to singing. Having appeared at roadhouses and with dance bands, he became a noted broadcaster, known as The Voice, and entered films 1943. Anchors Aweigh (1946), The

Miracle of the Bells (1948), and On the Town (1950) were among later films. Hysterical adulation by adolescent girls greeted his stage appearances—even in London, which he first visited in 1950. One of the most highly paid artists of his time, Sinatra was an ardent campaigner for racial tolerance.

Sinclair, **SIR ARCHIBALD HENRY MACDONALD** (b. 1890). British politician. Born Oct. 2, 1890, he was educated at Eton and Sandhurst, and entered the army in 1910. In 1912 he succeeded to the baronetcy of which his grandfather had been 3rd holder. He entered parliament as Liberal member for Caithness and Sutherland, 1922, and held the seat continuously until 1945. Sinclair was chief Liberal whip, 1930-31, and leader of the Liberal parl. party, 1935-45. In 1931 he was appointed secretary for Scotland, in the first national govt., becoming a privy councillor, but



Sir Archibald Sinclair,
British politician

resigned office the next year with other "Samuelite" Liberal ministers, in protest against the Ottawa agreement. He was constant in his criticism of the Chamberlain govt. during events leading to the Second Great War. In 1940, when Churchill formed his all-party government, Sinclair was appointed air minister, an office he held until 1945. He was lord rector of Glasgow university, 1938-45. The C.M.G. was conferred on him in 1922.

Sinclair, **SIR JOHN** (1754-1835). British politician. Born at Thurso, May 10, 1754, and educated at Edinburgh, Glasgow, and Oxford, he was called to the bar at Lincoln's Inn in 1782. He became M.P. for Caithness, 1780, for Lostwithiel in 1784, and a baronet two years later. An outspoken critic of Pitt and his policy, his study of agricultural economy and the ability he had shown in furthering improvements in the Highlands, pointed him out as first president of the newly-formed board of agriculture, 1793; and, with an interval of eight years, he held the post until 1813, when he retired. He died in Edinburgh, Dec. 21, 1835. Sinclair published much on Scottish agricultural affairs, and also wrote a Statistical Account of Scotland, with details of every parish.

Sinclair, **MAY** (d. 1946). British novelist. She was born at Rock Ferry, nr. Birkenhead, and educated at Cheltenham Ladies' College. Her earliest literary publications were two books of verse, 1887 and 1890, and some reviewing for philosophical journals; Audrey Craven, 1897, and The Divine Fire, 1904, established her reputation as a novelist. At first a realist whose novels were characterised by subtle character drawing and a fine style, as evinced in The Creators, 1910, and The Combined Maze, 1913, she later adopted an impressionistic technique in which she displayed acute psychological insight. Mary Olivier, 1919, Anne Severn and the Fieldings, 1922, A Cure of Souls, 1923, The



May Sinclair,
British novelist

Allinghams, 1927, are among the best known of the later novels. In middle age she wrote The Defence of Idealism, 1917, and The New Idealism, 1922, fruit of her philosophical studies. A biography, The Three Brontës, appeared 1912. In the First Great War she served with a field ambulance corps, which provided the material not only for her Journal of Impressions in Belgium, 1915, but for a novel about the war, The Romantic, 1920. She died Nov. 14, 1946.

Sinclair, **UPTON BEALL** (b. 1878). American writer. Born at Baltimore, Sept. 20, 1878, and educated at Columbia university, he was for long known most widely as the author of The Jungle, 1906, a novel which made so scathing an attack on the American meat-packing industry that President T. Roosevelt appointed a committee to investigate conditions in the Chicago stockyards. The report they issued revealed serious abuses, and led to reforms. Earlier novels by Sinclair had included King Midas, 1901; The Journal of Arthur Stirling, 1903; and Manassas, 1904. Later came many other publications, novels, plays, and political and personal pamphlets, revealing a socialistic view of contemporary life, e.g. King Coal, 1917 (based on the 1913



Upton Sinclair,
American writer

Colorado coal strike); The Brass Check (journalism), 1920; The Goslings (education), 1924; Oil!, 1927. He was a Socialist candidate for congress in 1906 and 1920, for the senate in 1922, and for governor of California, 1926 and 1930; and Democratic candidate for the last in 1934. Dragon's Teeth, 1942, awarded a Pulitzer prize, was one of a sequence of 12 novels with the same central figure (Lanny Budd), forming a dramatized study of the contemporary social and political scene.

Sind, SINDH, OR SCINDE. Prov. of Pakistan. In the area of British rule it was first an independent prov., then a sub-prov. of Bombay presidency, then (1937-47) again a prov. On the transfer of power in Aug., 1947, its capital, Karachi, became the h.q. of the governor-general of Pakistan. It comprises mainly an extensive alluvial plain, of which a large portion is occupied by the delta of the Indus, is mountainous on the W., on the Baluchistan border, has the Runn of Cutch on the S., and the Thar desert on the E. The rainfall is scanty, and agriculture is only successful in the area flooded by or irrigated from the Indus. Karachi is a great wheat port. The prov. was annexed in 1843 after the victory of Napier which was reported by him in a telegram saying simply *Peccavi* (Lat., I have sinned). Area, 47,000 sq. m. Pop. 4,535,008. See Bombay.

Sindbad. Name of two characters in the Arabian Nights entertainments. Sindbad the Porter is a poor man who, on making pious ejaculations outside a Bagdad merchant's sumptuous house, is called within. The master of the house declares himself to be Sindbad the Sailor, and proceeds to narrate the marvellous adventures that befell him in his seven voyages. See Arabian Nights.

Sindhi. Language spoken in Sind (v.s.). It is immediately derived from the Apabramsa Prakrit and contains three chief dialects, Lari (lower Sind), Siraiki (upper Sind), Thareli (desert). The Mahomedan population, which has introduced many Arabic and Persian words, uses the Arabic alphabet, modified to express certain peculiar Sindhi sounds. The Hindus have different alphabets, varying according to locality, all derived from an old Sanskrit alphabet. Sindhi is more purely Sanskritic and contains fewer foreign elements than the other dialects used in the N. of the Indian sub-continent.

Sindia. Name of a family of Mahratta rulers. Ranoji Sindia, the founder of the family, was a feudal chief of the peshwa of Gwalior in 1743, and his son Madhava Rao (fl. 1750-94) became the most important Mahratta prince in 1767. His exploits against the Sikhs, 1771, as antagonist to Britain in the war of 1778-82, and as conqueror of Gwalior, 1784, made him one of the most prominent characters in the Indian history of his time. He was an astute politician, a gallant if ferocious warrior, and an able ruler. His grand-nephew, Daulat Rao Sindia (reigned 1794-1827), was engaged in the second Mahratta war of 1803. Defeated at Assaye and Argaum, his realms were reduced to the territory of Gwalior, where he died without issue. Janakji Rao (1827-43), his adopted son, died childless, but his widow adopted Bagherat Rao Sindia (1835-86), during whose minority the country was reduced to anarchy. With the British intervention of 1843 the power of the Sindias was curtailed. See Mahratta.

Sinding, CHRISTIAN (1856-1941). Norwegian composer. Born at Kongsberg, Norway, Jan.



Christian Sinding, Norwegian composer

11, 1856, he studied at Leipzig, Munich, and Berlin. He then settled in Christiania (Oslo), where he taught and composed. His work is characterized by facility of construction, and by tuneful charm. In Norway he is ranked next to Grieg as a national composer. In 1890 the government granted him a yearly stipend, which later became a pension, to enable him to devote himself to composition. Best known for his piano music (e.g. the famous Rustle of Spring), he also wrote for

phonies, two violin concertos, a piano concerto, much chamber music, caprices, burlesques, many songs and arrangements of folk-songs, and his opera Det Hellige Bjerg (The Holy Mount), produced at Dessau in 1914 and in London the same year. He died at Oslo, Dec. 3, 1941.

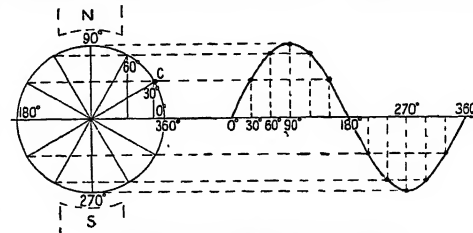
Sine. Term used in trigonometry. The sine of an acute angle may be defined as the perpendicular, i.e. the side opposite the angle, divided by the hypotenuse. The value of the sine never exceeds unity. See Trigonometry.

Sin-eating. Primitive custom formerly prevalent in Wales and adjacent English shires. Some villages had an appointed sine-eater, who repaired to the house of death, receiving over the dead body a loaf, bowl of ale or milk, and a small coin, thereby taking over its sins (Hosea 4, v. 8).

Sinecure (Lat. *sine*, without; *cura*, charge). In ecclesiastical terminology, a benefice without cure of souls. Sinecure rectories, i.e. livings given by a patron to a rector expressly without cure of souls, were abolished in 1840. By extension, the term has come to be applied to any office which has pay, but no work, attached to it.

Sine Curve. The curve produced when the sine of an angle is plotted against the magnitude of the angle. In the figure the sine (varying from +1 to -1) is plotted vertically, the magnitude (in degrees from 0 to 360) horizontally. Since the function $\sin \theta$ is periodic, the curve repeats itself indefinitely, to the right for angles over 360°, to the left for negative angles. The cosine curve would be of the same form, but displaced 90° to the left.

The sine curve provides the graphic representation of (simple) harmonic motion (*q.v.*) when displacement is plotted against time, and hence of the fundamental forms of wave motion. Thus the vertical profile of an uncomplicated system of ripples on deep water is a sine curve. In sound waves, the graph of pressure against time during the passage of a steady pure tone is a sine curve. In radio the unmodulated carrier waves are represented by sine curves or portions of them. In electricity the voltage gener-



Sine Curve. For explanation see text

other instruments. His principal works include his Rondo Infinito for orchestra, op. 42, three sym-



Singapore. 1. Government House. 2. Part of the waterfront from the air. 3. The Victoria Memorial Hall in the foreground, behind which, to the right, is the Supreme Court with its green dome, and the tower of the Cathay building in the background. 4. Anglican cathedral of S. Andrew, built 1861-70. 5. A scene on the river

ated by a conductor rotating in a magnetic field follows a sine law. If point C represents a conductor, and the poles producing the magnetic field are disposed as shown, the maximum voltage is generated when the conductor is moving directly across the field, and is zero when it is moving parallel to the field (at 0° and 180°). Its instantaneous value at any position will, in fact, be its maximum value multiplied by the sine of the angle at the given instant. See Electro-magnetic Machine.

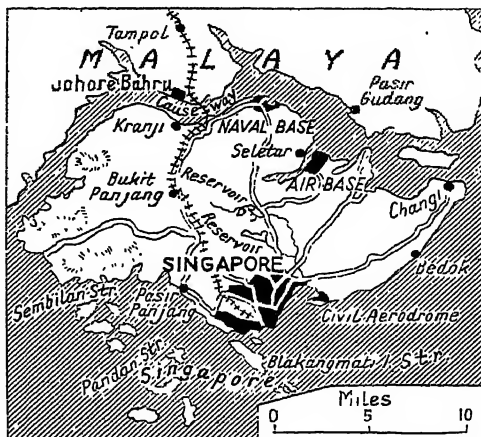
Singapore (Malay *Singapura*, city of the lion). Island off the S. of the Malay pen.; name also of the chief city of the island, and of the British crown colony which includes Singapore I., the Cocos (Keeling) Is., and Christmas I. Singapore Island is about 26 m. by 14 m. and has an area of 220 sq. m. It is joined to the mainland by a causeway carrying rail and road traffic across the strait of Johore, which is about $\frac{1}{2}$ m. wide.

The East India co. took a lease of the island in 1819 on the advice of Stamford Raffles (*q.v.*). It was then jungle and swamp, but Raffles saw its possibilities and was responsible for its initial development as a port and trading centre. In 1824 the island was ceded in perpetuity to the co., and

six years later was, with Penang and Malacca, incorporated in the presidency of Bengal. Control of Singapore, as of the other Straits Settlements, passed from the govt. of India to the secretary for the colonies in 1867. Christmas I. was incorporated with Singapore in 1900, Cocos Is. in 1903, Labuan in 1907. When the Straits Settlements was dissolved April, 1946, Labuan passed to British North Borneo, Singapore with Cocos and Christmas Is. (*qq.v.*) becoming a separate crown colony. The est. pop. of the island (1947) was 940,756, of whom 728,523 were Chinese, 116,583 Malays, 71,300 Indians, and 9,012 Europeans. Christmas I. had a pop. of about 11,500, Cocos Is. about 1,200.

The city of Singapore, on the S. coast of the island, began as a few primitive mud huts, but became one of the greatest and most pros-

perous ports in the world with some 7,000 ships calling annually, until its occupation by the Japanese during the Second Great War (*v.i.*); but in 1947 already the port was recovering, more than 2,500,000 tons of cargo being handled. Singapore's docks include the Empire, the Victoria, the Albert, and several dry docks. Among its many impressive buildings are Anglican and R.C. cathedrals, the Raffles museum, a



Singapore. Map of the island off the south of the Malay peninsula with its naval and air bases

library and college, and imposing govt. offices. It is the seat of govt. of the colony.

The decision to build Singapore naval base, which lies on the N. of the island, was taken at a meeting of the British cabinet June 16, 1921. Construction, which cost more than £11 m., started in 1923, but was held up by Labour govts. in 1924 and 1930. Work began on it again in 1934, and with the opening, Feb. 14, 1938, of the King George VI graving dock it was completed. That dock, the biggest to that date, could take the largest warship afloat, and made Singapore the most considerable British naval base E. of Malta.

SECOND GREAT WAR. British Empire forces retreating before the Japanese in Malaya withdrew from the peninsula to Singapore I. during the night of Jan. 30-31, 1942, and cut the causeway across Johore strait. An artillery duel across the strait followed; the naval base and three airfields, all within artillery range of the mainland, were out of use by Feb. 1. Further demolition of the causeway was carried out. An air raid on the city of Singapore on Feb. 4 killed 31 and injured 132, and others followed. Japanese troops under the command of Lt.-Gen. Yamashita made a first landing on the N.W. of the island in the Kranji area on Feb. 8; more landings were made next day in the W. and N.W., and the defenders were compelled to withdraw before the steady reinforcements poured across the strait by the Japanese, who had absolute superiority in the air. By the 12th the defenders had been driven back to a line running S.W. from Seletar to the city's reservoirs and the sea at Pasir Panjang. The loss of the reservoirs led Lt.-Gen. A. E. Percival to decide to agree to unconditional surrender on Feb. 15, 1942. (*Consult The War in Malaya*, A. E. Percival, 1949). From then until the surrender of Japan in 1945 Singapore, renamed by the occupiers Shonan, light of the earth, remained in Japanese occupation. It was the object of numerous Allied attacks from the air; in one, on Feb. 1, 1945, the 5,000-ton floating dock, scuttled in 1942 before the fall of the island and raised by the Japanese, was sunk again. British, Indian, and Gurkha troops took over control of the island without incident, on Sept. 5, 1945; and at Singapore on Sept. 12 Admiral Mountbatten accepted the surrender by Gen. Itagaki of all Japanese forces in S.E. Asia. Ex-

cept in the dock area, the city was undamaged.

From Sept., 1948, Singapore was once more the h.q. of the British Pacific fleet.

Singer, CHARLES (b. 1876). British scientific historian. Born in London, Nov. 2, 1876, and educated at the City of London School, at University College, London, at Magdalen College, Oxford, and at Heidelberg, he became professor in the history of medicine in London university, and acquired an international reputation by his many books on that subject and on the history of science, e.g. *A Short History of Science*, 1941; *Alum*, the First Chemical Industry, 1948.

Singer, ISAAC MERRITT (1811-75). American inventor. Born in Oswego, New York, Oct. 27, 1811,



I. M. Singer,
American inventor

he became a mechanical engineer, and set himself to the improvement of the early forms of the sewing-machine. He patented a single-thread and chain-stitch machine,

and exploited his invention with success. Singer lived latterly in Paris and England, dying at Torquay, July 23, 1875.

SINGING: ITS THEORY AND PRACTICE

F. G. Shinn, Mus. Doc., Professor, Royal Academy of Music

See the articles on the various musical terms, e.g. Alto; Bass Clef; Soprano; also the biographies of Patti and other great singers.

See also Harmony; Music; Opera; Oratorio; Voice

Singing is the production of musical sounds by means of the voice. Vocal or singing tone is produced by the breath being expelled from the lungs, through the wind-pipe, against the vocal cords so as to set these into sufficiently rapid vibration to produce a sound of definite pitch. The sound when it reaches the listener is, however, very different from that produced simply by the vibration of the vocal cords. This original sound is modified by various means, and its ultimate power and quality depend to a very large extent upon the employment of the chest, the cavity of the mouth, and the nasal and other cavities of the head as resonance chambers.

Voices may be divided into three classes—adult male voices, adult female voices, and children's voices. Adult males have the lowest voices, the names and normal compass of which are: bass (F below bass clef to D above it), baritone (A of bass clef to F above it), tenor (two octaves either side of middle C), alto (artificial extension of tenor).

Music for the baritone voice is now written in the bass clef, but previous to 1700 the baritone clef was used both in solo and choral music. Music for the tenor voice when written upon a separate staff is written in the treble (G) clef, an octave higher than it is sung, but the proper clef and the one used in old music is the C clef on the fourth line.

The male alto voice is sometimes a very high tenor voice—called a counter-tenor, but far more fre-

quently it is a development of the falsetto, or head voice of a bass or baritone. The alto part is now written in the treble clef, but in former times the proper alto clef was used.

Adult females have the highest voices, the names and normal compass of which are: contralto (A flat to E flat one octave higher), mezzo-soprano (B flat to A one octave higher), soprano (B flat below middle C to C two octaves higher). The parts for all these voices are written in the treble clef, but in old music each had its proper clef.

Children's voices, both male and female, are generally treble voices, but a few children have alto voices. The average compass of children's voices is rather less than that of adults.

Method of Breathing

In singing, one of the most important matters is breathing. This consists of two acts, inspiration and expiration. Inspiration is the taking in of breath, that is, the filling of the lungs. This, when done in a proper manner, results in the expansion of the chest and ribs, and in males of the abdomen also. Expiration is the letting out of breath, which, in singing, is the prime cause of the production of vocal tone. For the perfect regulation of the breath, full control over the muscles of the chest, the ribs, and the abdomen is required. The ideal of the singer is that his breathing should be imperceptible and inaudible to the listener, and that he should employ his breath in the most economical and effective manner in the production of sound.

The directing of the breath against the vocal cords, thereby setting these into vibration, produces vocal tone, which is largely reinforced and modified by means of resonance. The action of the vocal cords themselves and also the employment of particular cavities as resonance chambers vary to some extent with the pitch of the sound produced, and as a result, different parts of the vocal compass exhibit differences of quality. It is in this connexion that the word "register" is employed.

Notes are said to be in the same "register" when they are produced in the same manner, *i.e.* by similar action of the vocal cords and by the employment of the same resonance chambers. It is usual to refer to three registers, called the chest, the medium, and the head. The terms, chest and head, indicate the positions of the resonance chambers employed for the two registers so described, while the cavity of the mouth is the resonance chamber for the medium. Female singers generally have some notes in all three registers, but in male voices the greater part of their compass is in the chest register. In some voices there is a marked difference in quality between the registers, especially at the place described as the "break," where one register joins another. It is the aim of the singer, when changing from one register to another, so to assimilate the quality of the notes that the change is imperceptible. The usual method of obtaining this result is to train the higher registers downwards, and for this purpose the singing of scales down from the highest note forms a useful exercise.

Pronunciation and Articulation

Of hardly less importance than correct breathing and good production with proper resonance, is a clear pronunciation of the words sung. To pronounce well requires the employment of correct vowel sounds and clear articulation of the consonants. All vocal tone, and, therefore, all sustained tone, must be upon one of the vowel sounds. The articulation of consonants involves the interruption of vocal tone. The different vowel sounds are produced by modifying the shape of the mouth. When double vowels or diphthongs are employed upon a sustained note, as for instance *i* (in the word "light"), which is made up of *ah* and *ee*, the first vowel sound is sustained and the second is sounded quite shortly at the end of the note. Consonants are produced by the employment

of the lips, tongue, teeth, and other parts of the mouth in certain combinations. Among the more obvious faults in the pronunciation of singers may be included the employment of incorrect or modified vowel sounds owing to the unconscious adoption of vowel sounds which are easier of production, or upon which better vocal tone may be produced, and also the inadequate attention frequently given to the clear articulation of initial and final consonants.

Foundation of all Music

The earliest form of vocal music was purely melodic and unrhythmic, but the combination of singing with some form of dancing, or the repetition of some regular series of bodily movements or gestures, necessitated the introduction of the element of rhythm, *i.e.* the recurrence of strong and weak notes in some regular order which should coincide with the order of the various movements, and in this manner time and rhythm gradually entered into music. The earliest development of music is thus seen to be most intimately connected with singing, and when the materials of music began to be systematised, the first forms of scales—called "the modes"—were based upon the character and limitations of vocal music. The minstrels, troubadours, and minnesingers were important bodies of mediæval singers.

Early in the 17th century the rise of opera, with its recitative and arias requiring dramatic and expressive rendering, led to the development of singing as an art, and the first schools of singing were established in some of the principal cities of Italy. While in the first instance the rise of the opera exercised an influence upon singing, before long singing and singers began to exercise a powerful influence upon the form and character of the opera. The remarkable proficiency which singers rapidly began to acquire in the vocal art induced composers of opera to write music which should specially exhibit this skill, and in time an opera became little more than a series of vocal solos of different styles, loosely connected with one another by their relation to some story, but designed primarily to display the special powers of different singers. These conventional operas largely prevailed from the latter part of the 17th to the end of the 18th century, during which period the development of the art of singing reached a very high state of perfection, and many

singers appeared who possessed remarkable voices, over which they exercised wonderful control.

It was during this period that the Italians established that pre-eminence in the vocal art which they held unchallenged for so many years. Italy was the home of oratorio and of opera, in both of which the then most important parts were those taken by solo singers. In connexion with opera, Italian composers had created a distinctive type of work which had been almost universally adopted, and composers of other nationalities, like Handel, composed operas not merely upon the Italian model, but in which the Italian language was employed.

The very nature of the Italian language also was favourable to Italian pre-eminence. The purity of its vowel sounds, and the large proportion which were employed in it, made it specially favourable to the production of pure vocal tone, and it is possible that the large number of Italians who possessed, exceptionally fine voices was in some degree the result of this. All these circumstances combined to give Italian singers and teachers of singing a unique position in the world of music, and for a very long period enabled them to play the chief part in the development of the art of singing.

Influence of Opera

Since the end of the 18th century, the character of opera has been gradually changed, and it is no longer dominated by the solo singer. The demands which modern music makes upon the singer differ from those of earlier times, and in some directions are very much in advance of those. The size of the modern orchestra and the fuller and more elaborate character of the accompaniments have greatly increased the demands upon the physical capacities of singers. This has not infrequently led to the forcing of voices, much to their detriment and sometimes to their ultimate loss. But apart from this, the musical, intellectual, and physical powers which are required adequately to sustain a leading rôle in a Wagner opera are far in advance of those required by the opera singer of earlier times.

The development of choral singing has been due to quite other influences. One of the chief purposes of its early employment was to give vocal expression to the feelings of the body of worshippers in religious ceremonies. The singing of the choir and also of the whole congregation has formed an im-

portant part of religious services from the time of the Jewish worship in the Temple at Jerusalem, until the present day. During the Middle Ages secular choral singing was practised by the use of rounds and canons, and later on by madrigals, while sacred choral music was heard in the cathedrals and abbeys. The finest choral singing was probably that of the Sistine choir at Rome.

In Great Britain choral singing has always exercised a very great attraction for all classes of people, and there is no doubt that the choral singing which Handel heard in England greatly influenced him when he turned his attention from opera to oratorio. In the middle of the 19th century John Hullah showed to what a high standard choral singing might attain. In more recent times, owing to the excellent teaching of singing in many elementary schools and to other causes, choral singing and choral technique, in connexion with both secular and sacred music, have reached a remarkable pitch of excellence. A powerful incentive to this has been the development all over the country of the competition festival movement. Many towns both small and large organize an annual musical festival, and in most of these, choral competitions form an important part. Choirs of all kinds consisting of children's voices, male or female voices, and mixed choirs compete in the performance of music of every variety and of every grade of difficulty. Usually the standard reached is high. The choral technique required for the adequate interpretation of contemporary works is far in advance of the requirements of the early part of the 20th century. The overcoming of the difficulties of interval and melodic outline, of intonation and choral effect, of control over every degree of tone and every variety of tone colour, which is involved in the performance of many contemporary choral compositions, has raised to great heights the standard of choral technique.

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Singlestick. Weapon consisting of a thin, round ash stick, about 34 ins. in length, with a basketwork

hilt for the protection of the hand. The old style of cudgel play is now obsolete, the singlestick being



Singlesticks with basketwork hilts

employed in modern times as a medium for acquiring skill in the use of the light sabre. There are six cuts: two diagonally downwards at the head or shoulders, two in the same manner delivered upwards at the legs, and two at the ribs or stomach, given horizontally. See Fencing.

Single Tax. Idea popularised by the American economist Henry George (q.v.), whose Progress and Poverty, 1880, attributed the prevalence of poverty, in spite of material progress, to private ownership of land, and urged that the land must be common property. He argued that if the state took to itself all the economic rent of land and all the unearned increment which then accrued to the owners of urban sites, all other taxes could be dispensed with. See Land Value.

Sing Sing. Name of the state prison of the U.S.A. Situated 30 m. N. of New York City, just S. of a village, formerly called Sing Sing, but changed to Ossining in 1901, it dates from 1825 when the first building was opened. It took its name from the Sin Sink Indians.

Sing Spiel (Ger., sing-play). Form of opera having spoken dialogue as well as musical numbers. It is thus different from opera seria, in which the libretto is set throughout, and from opera buffa, in that it need not be of a comic character. Taking its rise in Germany, it became very popular there, and eventually developed into lyrical opera, as evidenced in Mozart's *Il Seraglio* and *The Magic Flute*. In France it is represented by *opéra comique*, while as examples in England may be mentioned the Savoy operas of Gilbert and Sullivan.

Singular Points. In mathematics, points of a curve or surface which present a non-metrical peculiarity. Such, for example, are nodes and cusps and conjugate or outlying points not adjacent to any other real point.

Sinhalese OR **CINGALESE.** Dominant native stock in Ceylon. Numbering some 2,500,000, two-thirds of them occupy the low country, one-third the Kandyan highlands. The aboriginal Vedda

population was dominated by a Dravidian stock and culture, and these were overlain by an Aryo-Indian immigration which introduced Buddhism. The modern Sinhalese speak an Indo-Aryan language enshrined in a rich literature of high antiquity. The traditional Buddhism is allied with much animistic spirit-worship, and with ritual devil-dancing for exorcising disease-demons. There are 246,000 Christian Sinhalese. See Ceylon.

Sinibuldi, GUITTONCINO DE. Italian poet generally known as Cino da Pistoia (q.v.).

Sining-fu. Town of China, in the prov. of Kansu. It is on the Sining-ho, 118 m. W.N.W. of Lanchow, and has an important caravan trade with Lhasa.

Sinis OR **SINNIS.** In Greek legend, a robber who preyed upon travellers on the isthmus of Corinth. He was in the habit of tying his victims to two trees bent towards each other and tied together, and then releasing the trees, so that their bodies were torn asunder. Sinis suffered the same fate at the hands of Theseus.

Sinister (Lat., left). In heraldry, the left side of the shield, as carried by its bearer. It is therefore the right side to those in front of him. The word is used for anything unlucky and therefore evil, this being due to the fact that left-handed persons were formerly regarded with suspicion. See Heraldry colour plate.

Sinjerli OR **ZINJIRLI.** Village in the Kara-Su valley on the E. Amanus slope, N. Syria. The ancient Shamal, it marks a prehistoric pastoral settlement whereon a post-Hittite walled citadel arose. Excavations, 1888-94, revealed a palace with sculptured reliefs dated 11th-9th century B.C. See Esharhaddon.

Sinkiang. Westernmost prov. of China, formerly known as Chinese Turkestan. It borders Tibet and Turkestan, and contains 59 counties and 11 administrative bureaux. The capital is Tihwa, and other important cities are Hami and Ining. There are no rlys., but highways connect the prov. with other parts of China and with the U.S.S.R. Chief products are wheat, cotton, livestock, and fruits. The inhabitants are Chinese, Mongols, Muslims, Kazakis, and other tribes. The prov. has been called China's "back door." In ancient times, and again during the China-Japan conflict of 1937-45, when it was well outside the areas of fighting,

it provided one of the two routes by which China maintained touch with the outside world. See N.Y.

Sinking Fund. In finance, an arrangement by which a sum of money is set aside at regular intervals either to repay a debt or to provide a fund sufficient to renew a wasting asset, e.g. a lease. The term amortisation (fund) is sometimes used as a synonym. Thus, if a company has bought a seven-year lease for £10,000 it should charge against profits each year as part of the cost of the premises both interest on the initial outlay and such a sum as will with compound interest provide enough seven years hence to renew the lease.

Again, a company may have borrowed £100,000 by means of 5 p.c. debentures repayable in 20 years. The company should provide each year, in addition to £5,000 interest, a sinking fund instalment towards the amount of £100,000 cash necessary to repay the debenture holders.

There are two principal methods of redeeming such loans: (1) to invest the periodical instalments and allow them to accumulate at compound interest until the expiration of the period (sometimes the instalments are invested in an insurance policy to provide the capital sum required); (2) to use the instalments year by year to pay back part of the loan, the parts to be repaid being decided by "annual drawings," i.e. by lot.

Sinking funds are created when local authorities borrow either from the public direct or from the public works loan board. The charge against the rates for such loans includes interest on the principal, plus an annual instalment sufficient to redeem the loan during the stipulated period, which is related to the probable duration of usefulness of the things (libraries, baths, tramways, etc.) acquired through the loan, and may be as long as 80 years for housing loans. On March 31, 1941, loans outstanding by local authorities in England and Wales amounted to £1,626 m.; against them there were sinking funds amounting to £61 m.

In 1786 William Pitt established a sinking fund, appropriating each year £1,000,000 to be paid to specially appointed commissioners for the reduction of the national debt. In 1792 it was provided that a fund of 1 p.c. of the capital of every loan should be raised by taxation, in

addition to what was required to pay interest. Successive governments, however, raided these funds in order to meet current expenditure. It was eventually seen that no sinking fund arrangement, however ingenious, can diminish debt unless its instalments represent real excess of revenue over expenditure. In 1829 it was decided to devote any surplus of revenue towards the reduction of debt. This arrangement is known as the old sinking fund.

A new sinking fund was introduced in 1875, when parliament enacted that a fixed annual sum should be set aside each year for the service of the national debt, and that any part of this fixed sum not required for interest should be used to reduce the debt. The sum was originally fixed at £27,400,000. This was reduced to £24,500,000 in 1910. The First Great War greatly increased the debt; but the idea of the new sinking fund was revived in 1928, when a new fixed annual charge of £338 m. was agreed upon. The Second Great War caused an increase in the national debt from £7,247 m. in 1939 to £23,773 m. in 1946, and an increase in the interest charge to £496.4 m.; an appropriate change in the total charge had not yet been agreed upon by 1950.

Debt reduction is also effected by (1) the sale by the national debt commissioners of terminable annuities; (2) the acceptance of Victory bonds and 4 p.c. funding loan in payment of death duties; (3) specific sinking funds, such as those for 3 p.c. funding loan, 4 p.c. funding loan, and 4 p.c. Victory bonds; (4) conversion operations, by which one security is substituted for another.

Sinn Féin. Irish nationalist movement of approx. 1905-22. The name may be translated as "Ourselves alone," and its adoption implied a belief that an attitude of self-reliance in matters political, economic, and cultural was the only means of safeguarding the distinctive national life of Ireland. Originally Sinn Féin looked only to the preservation of the Irish language and culture. But it also looked forward to an Ireland politically united in spite of differing creeds, and was soon dissatisfied with the policy of the Nationalist party. In *The United Irishman*, a weekly journal which he had founded in 1898, Arthur Griffith (q.v.) set forth in 1902 his so-called Hungarian policy, by

which all M.P.s elected for Ireland should abstain from attending the U.K. parliament and remain in Ireland to form a nucleus for a national government (as in Hungary in 1861).

By 1905 the Sinn Féin organization had become established as a political body. Many younger members of the Gaelic League, a non-political body founded by Douglas Hyde (q.v.), came under its influence. When the Irish Volunteers were formed in opposition to the Ulster Volunteers they rejected the control of the Nationalist leader, John Redmond, and allied themselves to Sinn Féin. In the First Great War, after first assuming an attitude of neutrality, Sinn Féin soon adopted a policy as inimical to the British as possible. Under James Connolly (q.v.) a policy of ambush, assassination, and covert murder was adopted by many.

The party broke into open rebellion in Dublin on April 26, 1916. This became known as the Easter rising. It was quashed, Connolly and 13 other leaders were shot, and more were imprisoned. From this dates the rapid growth of Sinn Féin among the general public.

De Valera (q.v.) was elected president of the movement in Nov., 1917, in succession to Griffith. A "republican" policy was inaugurated and the convocation of a constituent assembly decided upon. In the general elections of 1918, Sinn Féiners won 73 of the 105 Irish seats. Those elected never sat in Westminster, but constituted themselves as *Dáil Éireann*, and began to prepare for the establishment of an Irish republic. Republican courts of justice were set up, though suppressed as illegal, and the I.R.A. was organized to maintain guerrilla warfare against crown forces, military and police. There followed an era of murder and reprisals on both sides, throughout 1920-21, accompanied by a world-wide campaign against British rule. This period ended with the negotiations between Sinn Féin and the British govt., leading to the settlement of Dec. 6, 1921, which brought the Irish Free State into being. The Sinn Féin party was immediately split between those who supported the settlement and the followers of De Valera who opposed it. The treaty was passed by a narrow majority and De Valera resigned the presidency of the party. The split led to civil war, and to the virtual end of

Sinn Féin. See Eire; Ireland: History.

Sino-Japanese War. Details of the undeclared war between China and Japan, 1937-45, as well as of the wars of 1894-95 and 1931-33 will be found under China-Japan Conflict.

Sinon. In Greek mythology, a relative of Odysseus, whom he accompanied to the Trojan War. Distinguished for his cunning, he allowed himself to be taken prisoner by the Trojans at the siege of Troy. He persuaded the Trojans to drag the wooden horse into the city, and in the dead of night he opened the side of the horse and let out the band of armed men concealed within. See Trojan War.

Sinôpë or ΣΙΝΟΠ. Town of Asiatic Turkey. Situated on the S. side of the Black Sea, it is a considerable port. One of the colonies founded from Miletus, it passed in 183 B.C. into the possession of Pontus (*q.v.*). Diogenes and Mithradates the Great were born here. In the Middle Ages it was one of the ports of the empire of Trebizond. The Turks took it in 1470.

Sinter. In geology, chemical deposits of siliceous material surrounding hot springs or geysers. As it cools and evaporates the boiling water deposits the sinter, which is often beautifully coloured. The sinter terraces of Rotomahama in New Zealand (destroyed by eruption in 1886) and in Yellowstone Park, U.S.A., were and are extensively visited by tourists.

Sintering. Processes in metallurgy in which a number of fine particles are caused to agglomerate by the action of heat. The essential difference between sintering and other metallurgical operations is that the heat applied is never sufficient to cause melting of the particles, but at the most the merest beginnings of fusion or softening. There are two common applications of the process. First, many ores are sintered before smelting either in reverberatory or blast furnaces, because otherwise the very fine particles of ore would not stay in the furnace long enough to be smelted, but would be caught up by the furnace gases and driven up the chimney. The particles usually stick together because of the presence of sulphides or other compounds which soften at fairly low temps., and act as a pasty matrix. Secondly, in powder metallurgy, sintering is the essential stage following the formation of a compact and causing the close bonding of the

metal powders at temperatures well below their melting points. See Metallurgy; Powder Metallurgy; Roasting.

Sinuessa (mod. Mandragone). Town of ancient Italy. Situated on the Tyrrhenian Sea, at the mouth of the Voltumnus, 90 m. S.E. of Rome, and originally belonging to Campania, it afterwards formed part of Latium. It became a Roman colony 296 B.C., and was destroyed in the 10th century by the Saracens.

Sinus. In physiology, any hollow in an organ or anatomical structure, *e.g.* in a vein or bone. It is most frequently used for the complicated air-filled hollows in the head bones, which communicate with the nose. These cavities are lined with mucous membrane, and can be the site of acute and violent inflammation (*sinusitis*), demanding immediate surgical attention.

It is increasingly evident, however, that the contagious fevers, influenza, and the common cold, can cause a mild chronic inflammation giving rise to much discomfort by headache, a change in

fluid balance of the body tissues on which weight depends. Mental and emotional disturbances arise from the proximity of the infection to the brain.

Treatment of these sub-acute cases of sinus infection implies the opening of the entrance to the sinuses by the inhalation of medicated steam and by using sprays of a synthetic adrenalin which does not (like true adrenalin) reconvert a surface after decongesting it. A method has been devised of washing the mucous membrane of the sinuses with normal saline, thus stimulating it to recovery.

Sinusoidal. In electrical engineering, term applied to wave or current having sine form. See Sine Curve.

Sion or SITTEN. City of Switzerland, capital of Canton Valais. It is on the Sionne just above its junction with the Rhône, midway between Martigny and Brieg, 25 m. by rly. E. of St. Maurice. The castles of Tourbillon and Valeria are in ruins. Notable buildings are the Gothic town hall, the 15th century cathedral, the 13th century church of S. Catherine, and a cantonal museum. The Roman Sedunum, it became the seat of a bishop in the 6th century, and in 999 its bishop became count of Valais. Pop. est. 6,500.

Sion College. London institution. It was founded in 1632 by the will of Dr. Thomas White (*c.* 1550-1624), in London Wall, as a college and almshouse, a library being added by Dr. John Simson, one of his executors. In 1884 pensions were substituted for the almshouses, and the new building on the Victoria Embankment, E.C.4, designed by Sir A. Blomfield, was opened Dec. 15, 1886. It exists for the benefit of clergy of the Churches of England and Wales. In addition to the valuable library and reading room, the college contains portraits of Laud and other bishops.

Sioux. North American Indian tribe who call themselves Dakotas. Sioux is the termination of the French form of their Ojibwa name (enemies). It is used for the Siouan family, comprising many tribes in the Mississippi and Missouri basins, and including the Assiniboins. They number some 10,000, of whom under 2,000 are in Canada. See American Indians and colour plate; Assiniboins; Dakota. *Pron.* Soo.

Sioux City. City of Iowa, U.S.A. Situated on the Missouri, near its junction with the Big Sioux and



Sion College, London. The building on the Victoria Embankment

weight which has no relation to diet or exercise, and vague mental symptoms, such as poor concentration. The headache is caused by inflammation blocking the narrow opening to the sinus. The air in the sinus is in time absorbed, and the resulting vacuum causes pain. The headache tends to recur regularly at the same hour of day. The fluctuation in weight originates in the surrounding by septic material of the all-important pituitary gland, which controls all its fellows besides directing the

Floyd rivers, and served by several rlys., it is a leading livestock centre, cattle pens covering 10 sq. m. The trade area, through which pass the city's dairy products and bricks, lies between Colorado in the W. and Minnesota in the N. Sioux City was founded in 1849, and became a city in 1857. Pop. 79,183.

Sioux Falls. City of South Dakota, U.S.A. It stands on the Big Sioux river, in the S.E. corner of the state. Largest city in the state, it is named after nearby falls dropping 100 ft., which supply water-power to some 97 industries. The city is a major livestock market, and has a million dollar high school building, and 536 acres of public parks. Pop. 40,832.

Siphnos or **SIFANTO.** Greek island in the Aegean Sea. It is one of the Cyclades and has an area of 30 sq. m. The lowland is fertile and yields cereals, figs, wax, and honey; silk and pottery are produced. Pop. 5,000.

Siphon (Gr., tube). Bent tube, with limbs of different length, used for transferring or drawing

liquids from one vessel to another. The shorter leg of the tube is immersed in the liquid and the latter drawn over the bend by suction or other means. A constant flow of liquid takes place, due to the differences in pressure at the extremities of the two limbs. The flow ceases when the levels of the liquids in the two vessels are equal, or the extremity of the shorter limb no longer comes below the surface of the liquid.

Siphon Recorder. Electrical instrument receiving messages sent through submarine cables, and recording them in Morse code on a paper strip. Invented by Lord Kelvin, it consists of a fine glass tube, bent into a U form, attached, inverted, to a light coil suspended between the poles of a permanent magnet, and connected with the line and with earth. The signals received cause the coil and siphon tube to move to the right or left, according to the direction in which the current is sent for individual signals. The shorter limb of the siphon dips into a small ink vessel, by which it is

kept supplied. The longer almost touches a paper ribbon, which is moved mechanically at right angles to the swing direction of the siphon.

Sipontum. Port and commercial town of ancient Italy. On the Adriatic at the foot of Mt. Garganus, it was colonised by the Romans in 194 B.C. Manfred (1231-66), king of Sicily, transferred the inhabitants to a site about 2 m. to the N., where he built a new town, called after him Manfredonia. Remains of the old town have been discovered at Santa Maria di Siponto near by.

Sippara. Akkadian city at Abu Habba. On the left bank of the Euphrates, it is 40 m. N. of Babylon. Commonly identified with the biblical Sepharvaim, the two

Sippars dedicated to the sun-god Shamash and the goddess Anunit (Ishtar), its capture by Assyria resulted in Sepharvite colonists being settled in Samaria (2 Kings 17).

Sir (Fr. *sire*; from Lat. *senior*, an elder). Title of

honour. In the U.K. it is applied to baronets and knights. When James I instituted the order of baronets it was stipulated that the honour should carry the title "sir." The sovereign and princes of the blood royal are addressed as "sir."

Sirajganj. Town of E. Bengal, Pakistan, in the Pabna dist. It is situated on the Jamuna section of the Brahmaputra, is an important centre for the jute and rice trade, and has rly. connexions with Calcutta and Dacca. Pop. 32,000.

Sirdar (Hind. *sar-dar*). Title used in the East for military chiefs.

Siren (Gr. *Seirēn*). In classical mythology, a sea nymph who, by the power of song, lured to their ruin those who listened to her. According to the Odyssey the Sirens lived on an island near the Strait of Messina. As Odysseus's

ship approached the island he had the ears of his sailors filled with wax, and himself bound to the mast, and gave instructions that no matter what he said or did, the ship must not stop. When the spell of the Sirens' voices fell upon him he signed to his men to stop rowing, but they rowed on until the island and its dangers were passed. Encountered by the Argonauts, the Sirens were surpassed in singing by Orpheus, threw themselves into the sea, and were changed into rocks. In art they are often portrayed as birds with women's faces. Sirens are frequently represented on Attic tombstones.

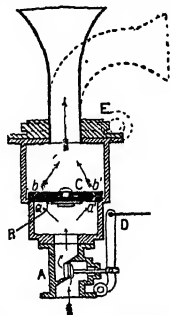
Siren (*Siren lacertina*). Species of amphibian, known as the mud eel. It is found in swamps of the S. dists. of the U.S.A. In colour



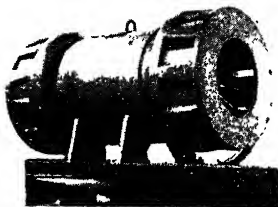
Siren. Two-legged amphibian, showing the external gills that persist throughout its life

black, sometimes spotted with white, it is about two feet long, and resembles an eel except that it has two very small fore-limbs and external gills.

Siren. Device for generating sound. Its simplest form is a disk with holes, driven on the turbine principle between two fixed plates with inclined holes. When the air passing through the holes on the stationary plate is cut by the revolving disk, a sound wave is generated, the frequency of which is governed by the speed of rotation and the number of holes in the disks. Electrically-driven sirens of this type were used in Great Britain in the Second Great War to sound the alert and all-clear signals before and after air raids. A warbling, or rising and falling, note indicated the alert; a note of constant pitch, the all-clear. As the frequencies of sounds emitted by siren can be determined in



Siren. Diagram of the instrument. See text



Siren. As used for warnings of air raids during the Second Great War

absolute terms, the device was once used in acoustic laboratories to establish sound intensity and pitch, but has now been generally replaced by electronic vibrators.

On ships' sirens there is only one revolving disk, as shown in the illustration. When the lever D is pulled, steam is admitted through the valve A, and passes through oblique holes, *a, a'*, in the fixed disk B and others, *b, b'*, in the rotating disk C; thus causing the latter to revolve at high speed, so that the steam passes in a series of rapid and regular puffs. This sets the air in vibration and creates a loud and penetrating note. Sirens on electric locomotives and on lighthouses use compressed air instead of steam. Some have horns, operated by gearing (as at E in illus.), to concentrate and direct the sound. Lighthouse sirens have a range up to 20 m. in favourable circumstances. A diaphone has a moving element which vibrates to and fro instead of revolving. See Fog Signals, p. 3440.

Sirenia. Order of the Mammalia, including only the dugong (*q.v.*) and the manatee (*q.v.*). They are specially adapted for an aquatic life, and have no hind limbs. There are flipper-like fore-limbs, and a horizontal tail fin. They are found off the coasts of the Atlantic and Indian oceans, and in estuaries, feeding on seaweeds.

Sirhind. Small town in Patiala state, India. It was formerly the name of a large tract which is thought to have included the states of Patiala, Jind, and Nabha, also the districts of Ambala, Ludhiana, and Jullundur, now in E. Punjab. The 16th century historian Ferishta calls it the most eastern possession of the Brahman kings of Kabul; later it became the frontier town (*sar-i-hind*, frontier of Hind) of the Muslims. Under the Moguls it was one of the most flourishing cities. In 1709 came its downfall when the Sikh leader Banda plundered it. Regarded as accursed by the Sikhs, it was totally destroyed by them in 1763, but relics of its former greatness remain in fine tombs and domestic architecture. Now used by the Patiala government as an assembly hall is the great Serai of the Moguls. The Sirhind irrigation canal takes off from the Sutlej at Rupa, the terminus of a branch rly., 33 m. to the N. Pop. 8,200.

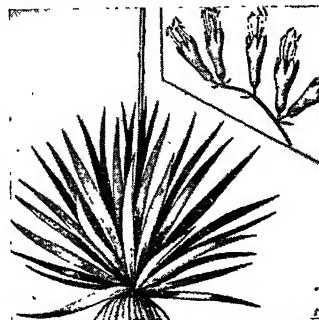
Sirius (Gr. *seirios*, scorching). Brightest star in the sky, with a magnitude of 1.6. Also known as Alpha Canis Majoris or dog star, it has a large parallax, measured

by Gill and Elkan at 0.37 secs., giving it a distance from the sun of approximately 8.8 light-years. It is a double star with a much fainter companion, discovered in 1862, and of about half its mass. Sirius is itself about two and a half times the mass of the sun; and the great intensity of its light, which, allowing for its great distance, must be 26 times that of the sun, accords with theoretical predictions. The star was venerated by the Egyptians, and to the Greeks was one of Orion's hounds, the other being Procyon. See Dog Days.

Sirius. British steamship. She was of 700 tons burthen and had engines of 320 h.p. Under command of Lieut. Roberts, R.N., she left Cork, April 4, 1838, and reached New York April 23, having been delayed a day by grounding off Sandy Hook. This meant an average of 5½ knots. She was in competition with the Great Western, which displaced 1,340 tons and had engines of 440 h.p. The latter left Bristol, under command of Capt. Hoskins, R.N., April 8, and reached New York the same day as the Sirius. Both ships met with very bad weather.

Sirmium. Capital of the province of Pannonia in the Roman Empire. It stood on the river Savus, and in the fourfold division of the empire instituted by Diocletian in 292 became the seat of government of Valerius, one of the four rulers. It is the modern Mitrovitza, Yugoslavia.

Sirmoor or **NAHAN.** Former Indian state, now in the Himachal union; also the capital town. The ruling family was descended from the Jaisalmir house in Rajputana. It is a mountainous area of 1,046 sq. m. to the N. of Ambala district, the Chor rising to 11,982 ft. There are forests of deodar and sal. The town is situated on the Siwauk Hills, 3,207 ft. alt., and has an iron foundry. Pop., state, 156,054; town, 7,136.



Sisal Hemp. Leaves and roots of *Agave rigida*; inset, flower spray

Sirocco. Term applied to any warm southerly wind by inhabitants of the N. shores of the Mediterranean Sea. Such winds may be dry or moist, dust-laden or clear. They occur in front of a depression, moving E. over the sea. The typical wind is hot and very dry, is probably frequently due to Föhn (*q.v.*) conditions, and is harmful to vegetation. The term has been extended to include similar warm, southerly winds experienced in the east of the U.S.A. See Wind.

Sirovy, JAN (b. 1885). Czech soldier and politician. Born in Bohemia, he practised as an architect in Warsaw before the First Great War. He lost his eye while fighting in the Czech brigade in the Russian army. After the Russian revolution he was commander of the Czech legionaries in the retreat through Siberia, and received a letter of thanks from King George V. From 1935 he was inspector-general of Czech forces, and became prime minister in 1938 during the German-Czech crisis, when he was forced to come to terms with the Germans and remodel the country on National Socialist lines. During the Second Great War Sirovy cooperated with the German forces, and after the liberation was sentenced to 20 years' imprisonment for treason.

Sirsa. Town of Punjab state, India, in Hissar district. It is situated on the rly. 50 m. N.W. of Hissar, and gives its name to a branch of the Western Jumna canal. The old town, founded as a fortress in the 6th century, was depopulated in the great famine of 1726. The new town N.E. of the old site was founded in 1837 as a centre for local trade, wheat and sugar being exchanged for salt and millet. Coarse cloth and pottery are manufactured. A cattle fair is held in late summer. Pop. 20,718.

Sis. Town of the vilayet of Seyhan, Asiatic Turkey, in the region anciently called Cilicia. It lies in the foothills of the E. side of the Taurus, about 45 m. N.E. of Adana, and has long been the religious capital of the Armenians in Turkey. Here, on the summit of a hill, they have an immense monastery. Once a considerable place, Sis has now a pop. of only about 4,000. Built on the site of the ancient Flaviopolis, it was the residence of the kings of Lesser Armenia from the 12th to the 14th centuries. In 1374 it was destroyed by the sultan of Egypt.

Sisal Hemp. Rope fibre obtained from the large leaves of *Agave rigida*, var. *sisalana*, a

perennial plant of the family Amaryllidaceae. It is a native of S. America. Several other species of agave yield valuable fibres, used for cordage, string, etc.

Siskin (*Carduelis spinus*). Species of finch. Distributed over Europe and parts of Asia, it nests in a few localities in the British Isles, but is better known as a winter visitant. The plumage is variegated with brown and grey, with a greenish yellow bar across



Siskin. Small species of finch that visits the British Isles in the winter

the wings. The nest is made of grass and moss, and is usually built high up in a pine or fir tree.

Sisley, ALFRED (1839-99). A French artist. Born in Paris, of English parents, Oct. 30, 1839, he studied at Gleyre's atelier, where he became acquainted with Claude Monet and other Impressionist painters. He painted river scenery, snow effects, and views of towns, generally in sunlight. His life was passed almost wholly in France. He died Jan. 29, 1899.

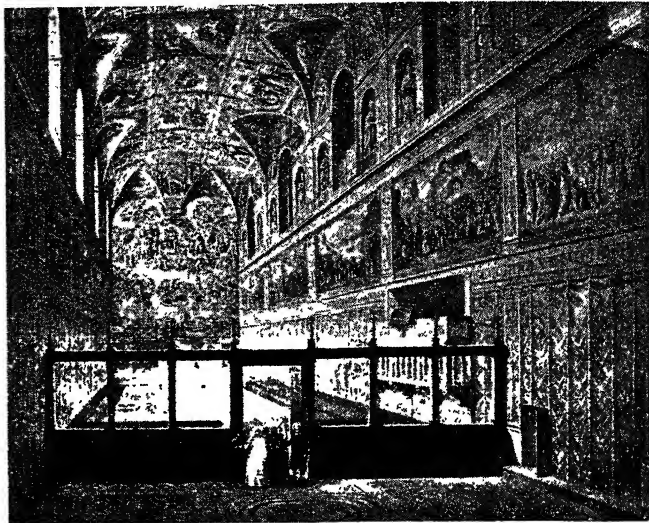
Sismondi, JEAN CHARLES LÉONARD DE (1773-1842). Swiss historian and writer on economics.

Of Italian descent, he was born at Geneva, May 9, 1773, and spent some of his early years in England and Tuscany. He held an administrative post at Geneva



J. C. L. Sismondi, Swiss historian

under the French Empire. Sismondi expounded economic theory closely akin to that of Adam Smith in his *Traité de la Richesse Commerciale*, 1803, and published his famous *History of the Italian Republics*, 1807-18. Other economic and historical studies, notably his renunciation of the English economic doctrines, *Nouveaux*



Sistine Chapel, Rome. Papal private chapel in the Vatican palace, built by Sixtus IV in 1480, and richly adorned with frescoes by Michelangelo

Principes d'Économie Politique, 1819, were followed by his *Histoire des Français*, 1821-43. He died at Geneva, June 25, 1842.

Sissek (Yugoslav Sisak). Town of Yugoslavia, in Croatia. It is 31 m. by rly. S.E. of Zagreb, at the head of navigation on the Save at its confluence with the Kulpa. Here was the ancient Siscia, where numerous Roman relics have been found. Pop. 6,000.

Sisterhood. Communities of R.C. or Anglican women living together under religious rule, but not enclosed in convents, and devoting themselves to active work for the good of the poor. Sisterhoods were first established by S. Vincent de Paul, in Paris, in 1633, under the name of Daughters of Charity.

In the 19th century arose a vast multiplication of active sisterhoods, some being little more than groups of pious women who agreed to live together for religious work. Dr. Pusey, in 1845, established a community at Regent's Park, London, which developed into the Society of the Holy Trinity, now established at Ascot Priory. In 1851 the All Saints Sisters of the Poor were founded by Harriet Byron; and about the same date the Sisters of S. John the Baptist, at Clewer, were established. Other congregations have been the Sisters of S. Margaret, East Grinstead, of S. Mary, at Wantage, of the Holy Cross, at Hayward's Heath. The sisters take the threefold vow of lifelong poverty, chastity, and obedience. See Deaconess; Monasticism.

Sistine Chapel. Private chapel of the popes in the Vatican, built by Pope Sixtus IV in 1480. Its chief glory is the magnificent series of frescoes by Michelangelo, illustrating the Creation and other O.T. themes, on the vault, and that of the Last Judgement on the altar-wall; there are also wall frescoes by Botticelli, Ghirlandaio, Roselli, Pinturicchio, and others. See Michelangelo; Rome; Vatican.

Sistova, SUSTOV, or SVISHTOV. Town of Bulgaria. It lies on the S. side of the Danube, about 45 m. N.E. of Plevna, and has a considerable grain trade. Here in 1791 the Austrians signed a peace with the Turks. Pop. 15,000.

Sistrum (Gr. *seistron*, rattle). Ancient Egyptian metal rattle, usually a bronze horse-shoe-shaped frame, pierced for three or four looserods, sometimes bearing jinglingrings. The handle was often Hathor-headed. It was held by women worshippers, especially in the later Isis ritual. It is also used in Africa, for instance among the people of the Benin dist. of Nigeria.



Sistrum used in Benin, Nigeria

Sisyphus. In Greek legend, a king of Corinth who was an able ruler, but noted for his deceitfulness and rapacity. For his many iniquities, or according to other stories, because he betrayed the secrets of the gods, Sisyphus was condemned after death perpetually to push up a hill an immense stone, which as soon as it reached the top always rolled down to the bottom.



Sittingbourne, Kent. Parish church of S. Michael

Sitapur. District and town of the Uttar union, India, in the Lucknow division. The dist. is situated between the Gumti and the Gogra rivers to the N. of the Lucknow dist. Wheat, barley, and millet are the chief crops. There is a large sugar industry with three model mills. Area, 2,250 sq. m. Pop., dist., 1,293,554; town, 25,530.

Sitka. Town of Alaska, U.S.A. Formerly the capital of the territory, and originally called New Archangel, it stands on the W. coast of Baranov Island, opposite Sitka Sound. U.S. govt. stations include an agricultural experiment outpost, a magnetic observatory, and a wireless telegraph station. The Russian Orthodox cathedral, with a spired dome, still stands; beside it, a Russian foundry once cast bells for mission churches in California. Sitka was the Russian capital down to 1867, and then the U.S. capital until 1906, when it was superseded by Juneau. Pop. 2,000, of whom two-thirds are Eskimos. See Alaska.

Sittang. River of Burma. It flows almost due S. for 350 m. between Pegu Yoma and Panglaung ranges to the Gulf of Martaban. Its valley is followed by the main rly. line from Rangoon to Mandalay.

During the Second Great War the Japanese drove the British W. of the Sittang by Feb. 28, 1942, and crossed it in strength early in March, which led to the evacuation of Rangoon to the W. on March 7. In April, 1945, troops of the British 14th army advanced rapidly down the Sittang valley to take Pegu on April 30. Fighting flared

up again along the Sittang N.E. of Pegu in early July and continued until the general surrender of Japan in Aug., Japanese forces isolated W. of the river seeking to escape across it towards Siam.

Sittingbourne and Milton. Urban dist. and market town of Kent, England, 10 m. E. of Chatham by rly. It has large paper mills, a brick-making industry, and is a centre of a cherry-growing district. It stands on Milton Creek, an arm of the Swale. It has some shipping, as the Swale connects it with both the Thames and the Medway. Milton was famous for its oysters. Near Sittingbourne are the remains of Tong Castle.

Sittingbourne was made a chartered town in the 16th century. It was on Watling Street and was a halting-place for pilgrims to Canterbury. S. Michael's church has a Norman tower, but generally dates from the 13th century. In 1921 a leaden font, in splendid preservation, was discovered in S. Margaret's church, Lower Halstow, near Sittingbourne. Market days, Wed. and Fri. Pop. 20,175.

Sitting Bull (c. 1837-90). American Indian chief, Tatanka Yotanka. He was born in N.



Sitting Bull, American Indian chief

Dakota, and was the son of Jumping Bull. The warlike chief of the Sioux of Dakota, he was ordered to return to his reservation. In the campaign that followed his refusal, Gen. G. A. Custer and his force were surprised and massacred. Sitting Bull escaped into Canada in 1879, but returned in 1881 under an amnesty. Following another rising, he was arrested, Dec. 15, 1890, and was shot during an attempt at rescue.

Situla (Lat.). Term used in archaeology for a bucket or pail, especially of the early metallic ages. At Hallstatt (*q.v.*) cylindrical or conical flat-bottomed vessels, of riveted bronze plates, often bear on sides and lids embossed geometrical and animal designs, showing Oriental contact. Specimens from Ireland exhibit Celtic ornament.

Sitwell, EDITH LOUISE (b.1887). English poet and critic. Eldest child of Sir George Sitwell and sister to Osbert and Sacheverell (*v.i.*), she was born in Scarborough Sept. 17, 1887, and educated privately. She and her brothers were among the most discussed writers



Edith Sitwell, English poet

of their time as much for their deliberate personal eccentricity and flouting of accepted standards as for their innovations. During 1914-16 she edited *Wheels*, an annual anthology of current verse. Though her own work was not popular, owing to its difficulty, she made a real contribution to poetry by the freshness of her diction and the flexibility of her rhythms. Her obscurity came from her unusual use of words. In 1923 she gave a poetry recital (to music by William Walton), speaking behind a curtain painted with a female figure with closed eyes and mouth open, to demonstrate her theory that spoken poetry should emphasise musical cadence and dissociate itself from the poet's personality. Her works included *Selected Poems*, 1936; *Green Song*, 1944; *A Song of the Cold*, 1945; *The Canticle of the Rose*, 1949; studies of Alexander Pope, 1930, of Bath, 1932, of the English Eccentrics, 1933, of Victoria of England, 1936; and an anthology *The Pleasure of Poetry*, 3 vols., 1930-32.

Sitwell, SIR OSBERT (b. 1892). English author. Francis Osbert Sacheverell, elder son of Sir George Sitwell, 4th bart., whom he succeeded in 1943, was born in London, Dec. 6, 1892. He was educated at Eton (in his own words, during the holidays from Eton), and was an officer in the Grenadier Guards, 1912-19, serving in France 1914-16. The satirist among the Sitwells (*v.s.* and *v.i.*), he published in 1916, in collaboration with his sister Edith, *Twentieth Century Harlequinade*, which included his first bitter verse.

Argonaut and Juggernaut, 1919, *The Winstonburg Line*, 1919; *Out of the Flame*, 1923, and *England Reclaimed*, 1927, continued this



Sir Osbert Sitwell, English author

satirical vein; a collected edition of his poems and satires appeared in 1931. A more creative impulse is apparent in his humanly discerning fiction, *e.g.* Before the Bombardment, 1926; Triple Fugue (short stories), 1934; and flowered in his volumes of autobiography: Left Hand, Right Hand, 1945; The Scarlet Tree, 1946; Great Morning, 1948; Laughter in the Next Room, 1949; Noble Essences, 1950. Other books included Escape with Me, 1939, a book of travel in the Far East; Sing High, Sing Low, 1944 (essays). Selected Poems appeared 1943.

Sitwell, SACHEVERELL (b. 1897). English poet and writer. He was born in Scarborough Nov. 15, 1897,



Sacheverell Sitwell,
English poet and
writer

the younger son of Sir George Sitwell and brother of Edith and Osbert (*v.s.*). Educated at Eton and Oxford, he was in the Grenadier Guards 1916-18. His poetry was more lyrical and less artificial than his sister's, but, like her, he delighted in sustained imagery that produced the effect of a brittle, unreal world. His best known verse included Hortus Conclusus, The People's Palace, The Hundred and One Harlequins, The Thirteenth Caesar, The Cider Feast. Nurtured in a gentle family having close association with the land, and oppressed by the vulgarity of the contemporary world, he sought the unusual in scene and custom, recording it in books of evocative description, such as Southern Baroque Art, 1924; German Baroque Art, 1927; The Gothick North, 1929; Poltergeists, 1940; Primitive Scenes and Festivals, 1942; The Netherlands, 1948. He also published biographies of Mozart, 1932, and Liszt, 1936; and the autobiographical All Summer in a Day, 1926.

Siut. Town and prov. of Upper Egypt, also known as Assiut (*q.v.*).

SIVA or **SHIVA** (Skt. *śiva*, propitious). In Hindu religion, one of the chief triad of gods. By his worshippers, the Sivaites (*v.s.*), is called Mahādeva, the great god, properly he is the principle of destruction and reproduction. In the latter capacity his symbol is the linga or phallus. He is represented with four hands and three eyes, with a garland of skulls round his neck, generally seated and absorbed in

thought. His weapons are the trident, bow, thunderbolt, and axe. His wife is Durgā, Kālī, or Devī (*q.v.*). See Hinduism; Lingayat; Rudra.

Sivaites. Followers of one of the two main sects of Hinduism, the other being the Vishnuites. They worship Siva (*v.s.*) as the chief deity. The sect is particularly strong in the extreme N. of India, and in the S. and is subdivided into Saktas and Thugites. See Hinduism.

Sivaji (1627-80). Mahratta raja. The son of a soldier, he was born in Bijapur, and early showed himself ambitious and eager to expel the Mahomedans from the Deccan and Western India. By incessant conspiracies and rebellions he welded the Mahratta tribes into unity. He died April 5, 1680.

Sivan. Third month in the Jewish sacred and ninth in the civil year. Corresponding approximately to the month of June, it is mentioned in Esther, and the feast of weeks is observed on its sixth day.

Sivas. Town of Turkey, the ancient Sebastea. The capital of the vilayet of the same name, it is situated on the Kizil Irmak, about 160 m. S.W. of Trebizond. A great centre of trade, it exports grain and wine. Samsun is its port. In Roman times it was the second city in Asia Minor. Pop. 45,419, including many Muslims. The vilayet of Sivas contains silver, lead, copper, iron, and coal. It was the scene of Armenian massacres in 1895. The area of this fertile vilayet is about 24,000 sq. m., and its pop. 494,373.

Siwa. Oasis in the Egyptian desert, near the Libyan border. About 150 m. S. of the Gulf of Sollum, its length is about 30 m. and its breadth from four to five m. Olives and dates are grown. The oasis contains two towns, Siwa and Aghourmi. The Siwans are of Berber origin, and are divided into two religious sects—the Senussi and Madani. The temple of Jupiter Ammon, 1½ m. E. of Siwa, was visited by Alexander, Lysander, and Croesus. Siwa figured in the British campaign against the Senussi in the First Great War, being the scene of their defeat on Feb. 5, 1917. See Senussi.

Siwalik Hills. Section of the sub-Himalayan ranges, abutting on the great plain of N. India. They stretch W. from the point where the Ganges debouches from the mountains, and give rise to the Jumna. Their average height is 2,000 ft. and they are heavily wooded. See Himalayas.

Siward (d. 1055). Earl of Northumbria. A Danish follower of Canute, he was made earl of Deira, and in 1041 acquired Northumbria by murdering his wife's uncle. After supporting Edward the Confessor against Godwin, he was sent to oppose the usurper Macbeth in Scotland, defeating him on July 27, 1054. He died at York. Siward figures in Shakespeare's Macbeth.

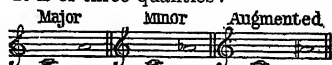
Six, LES. Group of French composers. It was formed in Paris in 1917, under the leadership of Erik Satie (*q.v.*) and the dramatist Jean Cocteau (*q.v.*), and was intended to assist the development of music. The six composers who gave the group its name were Georges Auric (b. Feb. 15, 1899), Louis Durey (b. May 27, 1888), Arthur Honegger (b. March 10, 1892), Darius Milhaud (b. Sept. 4, 1892), Francis Poulenc (b. Jan. 7, 1899), and Germaine Tailleferre (b. April 19, 1892). Among the performers attached to the group was Andrée Vaurabourg, who married Honegger. The group gradually broke up during the 1920s. See Honegger; Milhaud; Poulenc.

Six Acts, THE. Measures passed by the British parliament in 1819, at the instance chiefly of Castle-reagh and Sidmouth. Prompted by the disturbed state of the country, due to the industrial depression which followed the Napoleonic Wars, and to discontent with the reactionary policy of the government of Lord Liverpool, they provided especially for the suppression of illegal drilling and arming, of riotous assemblies, and of seditious publications. See Industrial Revolution; United Kingdom.

Six Articles, STATUTE OF. Law passed by the English parliament in 1539. The statute affirmed the doctrine of transubstantiation, communion in one kind only for the laity, celibacy for the priesthood, auricular confession, and prayers for the dead. So severe were the penalties prescribed that the statute was called by Protestants "the whip with six strings." It was repealed in 1547.

Six Nations. Name given in the 18th century to the Indian nation of the Iroquois. Originally comprising five tribes, and called the Five Nations, in 1715 these were joined by the Tuscaroras, and the name was changed accordingly.

Sixth. In music, an interval comprising six degrees of the scale. It is of three qualities:



The chord of the sixth is the first inversion of a triad, and is so called because the bass is figured 6. See *Thorough-bass*.

Sixtus. Name of five popes, of whom IV and V are noticed separately. Sixtus I (or Xystus) was the 7th bishop of Rome from about 115 to 125. Sixtus II was martyred under Valerian, 258, and his festival is kept on Aug. 6. Sixtus III was pope 432-440.

Sixtus IV (1414-84). Pope 1471-84. Born near Albissola, July 21, 1414, his name was Francesco della Rovere. He entered the Franciscan order in early youth, in 1467 was created cardinal, and in 1471 was elected pope. Plunging into Italian politics, and placing a large number of his relatives in high office, he made war against Florence, 1478. A patron of art and letters, he built the Sistine chapel and the Sistine bridge in Rome, and refounded the Vatican library. He died Aug. 12, 1484. *Consult* History of the Papacy, M. Creighton, new ed. 1897.

Sixtus V (1521-90). Pope 1585-90. Born near Montalto, Dec. 13, 1521, the son of a gardener, his name was Felice Peretti. He entered the Franciscan order at 12, rose to high office in his order, was created cardinal 1570, and elected pope 1585. He exterminated brigandage in the papal states and accumulated vast wealth for the papal exchequer. His only expenditure was on many public buildings in Rome. Sixtus recognized and reformed the papal curia by the establishment of 15 congregations (or committees) for the management of ecclesiastical affairs. On the execution of Mary Queen of Scots, 1587, he proclaimed a crusade against England. He died Aug. 27, 1590.



Sixtus V.
Pope during 1585-90

Sizar. In Cambridge university, term applied to an undergraduate holding a junior emolument called a sizarship. The word *size* was formerly given to an allowance of food and drink. Originally the sizar earned his board by distributing victuals to the pensioners and scholars. See *Scholarship*: University.

Size. Agglutinant used in many industrial processes. In weaving textile fabrics the warp-thread is sized to prevent the fraying out of its fibres, and hence to strengthen

the thread against breakage under tension in the loom. For this purpose a size is favoured composed of starch or of flour-paste, with tallow or oil added to prevent stiffening, and an antiseptic like zinc chloride to kill mildew. The sizing of cloth may include loading with minerals. To make wheat-flour size, the flour is steeped in water for weeks or even months, then boiled and mixed with other ingredients.

Less commonly used for sizing various fabrics are the starches derived respectively from potatoes (*farina*), sago, maize, tapioca, and rice. Other materials used are dextrin, gum tragacanth, gum tragacanth, Iceland moss and Irish moss, gelatine (glue, and bone size).

Size, as used by house painters and paperhangers, may be generally described as a weakened glue, and is obtained by boiling under pressure the residue of the process of making gelatine. Occasionally the paperhanger makes his own size from parchment clippings, which are placed in a saucepan to simmer for two hours or so, the resultant size being strained through muslin. It settles as a thin jelly, and is applied with a brush or a sponge.

Vegetable size is free from the objectionable odour of animal size, is but little subject to decay in storage, and, being colourless, does not stain or darken the materials with which it comes in contact. Size is applied to various surfaces to fill the pores or to prevent suction, technical expressions for its function of checking the absorption of paste or varnish. Mixed with various pigments, it makes a binding material for colour washes or distempers.

Gold size is an oil varnish preparation containing a high proportion of resin with a minimum of thinner. It dries to a hard, tenacious coating which can be rubbed clean when dry, thus providing a firm, uniform surface for subsequent coats of paint and varnish. It is also an adhesive for gold leaf.



Sjambok. Whip made of rhinoceros hide

Sjambok. Rhinoceros-hide whip used in S. Africa. The Afrikaans word is derived from Malay *chabok*, which comes from the Persian *chabuk*, meaning a whip, or, adjectively, alert. *Pron.* zhambock.

Skagen or **THE SKAW.** Cape and port of Denmark. The cape, the N. extremity of the peninsula of Jutland, is a narrow spit of sand with a high lighthouse. The

adjacent port is 24 m. by rly. N. of Frederikshavn. New Skagen is a seaside resort on the Kattégat. Pop. 6,446.

Skagerrak. Strait between Norway and Jutland, connecting the North Sea by the Kattégat and the Sound with the Baltic Sea. With a mean breadth of 80 m. its length is about 150 m. Near Jutland are dangerous shoals and sandbanks; towards the coast of Norway lies the E. end of the Norwegian deep, a steep valley in the floor of the North Sea, where the depth is 2,000 ft. Violent N.W. storms interfere with navigation. The Germans call the naval engagement of Jutland (*q.v.*) the battle of Skagerrak.

During the Second Great War the Skagerrak was heavily mined by the Germans; but because the U.K. needed Swedish products, in particular ball-bearings, in greater quantity than could be carried by air, five small, very fast, easily handled vessels, the Master Standfast, the Gay Corsair, the Gay Viking, the Hopewell, and the Non-such, with fair cargo space for their size, were designed and built to run the Skagerrak blockade to the port of Lysekil as unarmed merchantmen. They were in service during the winter of 1943-44; only the Master Standfast was lost, captured in Swedish waters by German warships.

Skagway. Sea port of Alaska. It is situated on Chilhoot Inlet, Lynn Canal, and is the terminus of the rly. to the Yukon and the steamer service to Seattle. It was settled in 1898 as a port of entry for the men taking part in the Klondike gold rush in that year, and was the main channel for the settlement of Alaska. It has a public library, a U.S. govt. building, and three hospitals. Pop. 492.

Skald or **SCALD.** Ancient Scandinavian, and more especially Icelandic, poet, corresponding to the bard of the early Britons and Celts. They sang or recited their compositions concerning the deeds of heroes at feasts and other public gatherings. Apart from one or two poems, such as the Song of Lodbrok, the poetry of the skalds is represented mainly by fragments in the sagas and the Eddas (*q.v.*).

Skara. City of Sweden. Situated 75 m. direct N.E. of Gothenburg, between Lakes Wener and Wetter, it has a valuable library and an important veterinary school. Its Gothic cathedral, 1151, destroyed by fire in 1947, belonged to the oldest episcopal see in the country. Pop. 4,500.

Skaraborg. Län or county of Sweden. It is situated between Lakes Wener and Wetter, and is crossed by the Göta Canal, which connects them. Dairy farming is important, especially in connexion with the manufacture of cheese. Munitions are made at Karlsborg. Area 3,273 sq. m. Pop. 241,466.

Skargard. Term applied to the islets which fringe the fjord coast of Norway. It means wall or fence of skerries or rocky islets. The waters between the skerries and the mainland are in general smooth, and largely navigable.

Skarn (Swedish). In geology, a type of metamorphic rock formed from limestone by the incoming of hot solutions carrying silica and various metals. It is commonly associated with iron and sulphide ores.



Skate. Edible fish, showing the flattened body, broad fins, and whip-like tail

W. S. Berridge, F.Z.S.

Skat. Card game played by three players, with a pack of 32 cards, the 6 to 2 inclusive of each suit being discarded. The three players are termed Vorhand, Mittelhand, and Hinterhand, with sometimes a dealer and even another player, who take no active part in every round, but change places alternately with the others, though whichever two players are standing out pay or receive, according to the result of the round.

The dealer gives three cards to each player, then two to the table for skat, and afterwards deals two more rounds to each player, first four cards and then three. Thus each of the players holds ten cards, and two cards are in skat.

The four jacks are always trumps, ranking in the order of their suit: clubs, spades, hearts, and diamonds. After these, the cards of the trump suit follow in the order of ace, 10, king, queen, 9 to 7. When no trumps is declared the cards bear their usual sequence.

The object of the game is to acquire a certain quantity of points in the tricks won. The ace counts 11, the ten 10, king 4,

queen 3, jack 2. The nine, eight, and seven score nothing. There being four suits with 30 points in each, a pack contains 120 points; the caller must score at least 61 to win. Or a player may elect to play to lose so many points. The following are the principal declarations: When one of the skat cards is turned to decide trumps, it is a *tournee*; a solo is when a player names a suit from his own hand. A trump suit is called a club solo, spade solo, etc. Jacks being the only trumps is termed a *grand*. If a jack is turned up from skat, the player may make whatever suit it may be trumps, or declare jacks only, at discretion. This is called a *turned grand*. Nullo is a declaration of no trumps. The cards in the skat always count to the caller, whether or not he may have previously taken them into his hand in exchange for cards of his own.

Skate. British food fish, of the Elasmobranch (plate-gilled) group. The skeleton is cartilaginous and the body greatly flattened, with broad pectoral fins and a whiplike tail. The common skate (*Raja batis*) varies from two to four ft. in length, and is greyish on the upper parts, with small black spots. It belongs to the ray family. There are twelve British species, all edible.

Skating. Locomotion on ice by the aid of mechanical attachments to the feet. Skates, runners as they were once termed, were originally made of metacarpal bones of animals and bound on to the foot. Later, runners were shod with iron, and so came the iron blade fitted into a wooden holder attachment to the sole of the boot by screws and straps. To these succeeded steel skates which can be clamped to the sole of an ordinary walking boot. The speed and artistry of modern

skating demands the use of skate and boot combined. For figure skating the blade should project only slightly at the toe and heel, whereas for speed skating a long blade achieves the best results.

The fen country can be regarded as the English skating nursery, although today the greater part of British skating is performed on indoor ice. There are 28 ice skating rinks in Great Britain (1948). When an exhibition to illustrate the history of fen skating was staged at the Cambridge and County Folk Museum, the earliest skates shown were those with blacksmith-made iron blades. A later pair with leather backs at the heel had a semi-obliterated trade mark, which read: *Ichens Improved Skate Registd April 22, 1842*. Among the trophies was a silver cup inscribed: *Jas. May. A prize won by skating at Upwell, Jany. 5, 1821*.

Figure skating has been developed into a fine art, and diagrams of great delicacy and complexity are cut on the ice by experts. The backbone of all these intricacies, however, consists of two turns at a given point, the turn towards the centre and the turn away from the centre. These are known as *rockers*, *counters*, *brackets*, *threes*, etc., according to the change of edge or direction.

Skating is controlled in the U.K. by the National Skating Association of Great Britain, under whose auspices grading tests are held for skaters. In figure skating there are six tests: preliminary; third class; intermediate second class; second class; intermediate first class; and first class. In free skating a competitor performs his, or her, own interpretation of chosen music, for a period of four



Skating. Left, A. Seyffarth, ice speed champion in action at St. Moritz; right, a competitor in the British amateur figure-skating championships, 1943

minutes. The American trend in free skating is to include high jumps in this programme.

The British, European, and World championships are held annually, and the Olympics once in four years. The 1948 Olympic skating results were: men's figure skating, R. Button (U.S.A.); women's figure skating, Barbara Ann Scott (Canada); pairs skating, Micheline Lannoy and Paul Baugniet (Belgium); speed skating, 500 metres, F. Helgesen (Norway), 43.1 secs., an Olympic record; 1,500 metres, S. Farstad (Norway), 2 min. 17.6 secs., an Olympic record; 5,000 metres, R. Liakley (Norway), 8 min. 29.4 secs.; 10,000 metres, A. Seyffarth (Sweden), 17 min. 26.3 secs.

Bibliography. A Handbook of Figure Skating, G. H. Brown, 1905; Figure Skating, H. R. Yglesias 1905; Figure Skating, Bror-Meyer, 1908; Theory and Practice of Figure Skating, G. Fuchs 1926; Modern Figure Skating, T. D. Richardson, 1930 (2nd ed. 1938); Skating for Beginners, E. Jones, 1935; Ice Rink Skating, T. D. Richardson, 1938 (new edn., 1948); The Complete Figure Skater, T. D. Richardson, 1948.

Skean-dhu (Gael, black knife). Dirk or small dagger carried by Scottish Highlanders in the stocking. A skean was an old Irish dagger or short sword. *See* Dirk; Highlands. *Pron.* skeen.

Skeat, WALTER WILLIAM (1835-1912). British philologist. He was born Nov. 21, 1835, educated



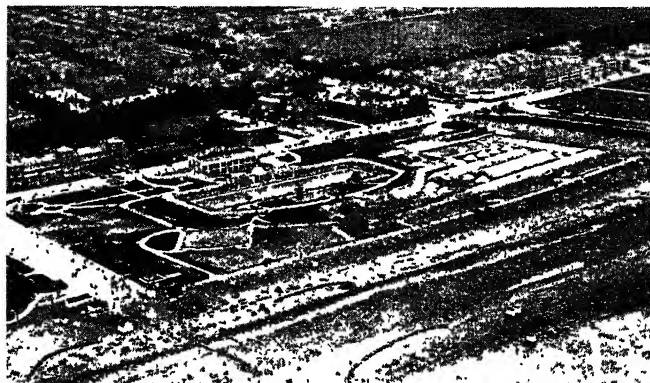
W. W. Skeat,
British philologist

at Highgate and Christ's College, Cambridge, and appointed professor of Anglo-Saxon in that university in 1878. He died Oct. 7, 1912. One of the greatest of English scholars, Skeat edited Lanceland's *Piers Plowman*, Chaucer, and Chatterton; *Etymological Dictionary of the English Language*; *Early English Proverbs*; *The Science of Etymology*. A *Student's Pastime* is a collection of 30 years' contributions to *Notes and Queries*, with an autobiographical introduction.

Skeffington, SIR WILLIAM (d. 1535). English politician. The eldest son of Thomas Skeffington of Leicestershire, he became known to Henry VII and was made master of the ordnance. In 1529 he became an M.P. and deputy for the lord-lieutenant of Ireland,

but his first stay there was brief. In 1534 he returned, and for nearly two years was responsible for the conduct of affairs, warring against Kildare until the Irish earl was compelled to submit. Skeffington's capture of Maynooth was a notable event. He died at Kilmainham, Dec. 3, 1535.

Skegness. Seaside resort and urban dist. of Lincolnshire, England. It is on the E. coast, 24 m. N.E. of Boston, with which it has rly. connexion. The town has been developed since the opening



Skegness. A section of the very extensive sands with the bathing pool and amusement park

of the rly. in 1873, and owed popularity to John Hassall's poster of a dancing fisherman with the words "Skegness is so bracing." Attractions are fine sands, a pier, and golf links. Part of the town is called Seacroft. At Skegness William Butlin (*q.v.*) opened his first holiday camp; during the Second Great War this became a principal R.N. training centre. An earlier Skegness was a seaport, destroyed by the sea in the 15th century. Pop. 11,000.

Skeleton (Gr., dried up). The hard framework of a body, formed mainly of bones, but completed in places by cartilage. The term *exoskeleton* is applied to hard parts on the exterior of the body, such as the carapace of a tortoise, the bones in the interior forming the *endoskeleton*. Among the mammalia there is little trace of an exoskeleton, except the horns of some species. In man the cartilaginous parts of the skeleton are the disks between the vertebrae of the spinal column or back-bone, and the costal cartilages which connect the ends of the ribs with the breast-bone. The ends of the long bones and the sockets or surfaces with which they articulate are also covered with cartilage to

facilitate movement and provide some degree of elasticity. The human skeleton consists of some 200 bones. *See* Anatomy; Archaeology; Burial Customs; Plesiosaurus; Pterodactyl; Reptile.

Skelligs. Three small rocks off the S.W. coast of Kerry, Eire. They are known as Great and Little Skellig and Lemon Rock, and abound in sea-fowl. Great Skellig, alt. 710 ft., has the remains of a monastery, formerly resorted to by pilgrims. There is a lighthouse on one of the rocks.

Skelmersdale. Urban dist. of Lancashire, England. It is 8 m. by rly. N.N.W. of St. Helens. The chief industries are the manufacture of shors and straw rope and the dehydration of potatoes. The chief building is S. Paul's church. Until the industrial developments of the 19th century, the place was a village, and long the property of the old family of Skelmersdale. Pop. 7,000.

Skelton. Village of Yorkshire (N.R.), England. It is 11 m. E. of Middlesbrough and forms part of the urban dist. of Skelton and Brotton, which has rly. stations. Skelton Castle occupies the site of a Norman stronghold. The chief occupation of the village, which once was a market town, is in the extensive ironstone mines. Pop., urban dist., 13,654.

Skelton, JOHN (d. 1529). English poet. Born probably about 1440, he is claimed as an alumnus by both Oxford and Cambridge. He took orders, became tutor to Prince Henry, afterwards Henry VIII, and for a time was rector of Diss in Norfolk. His earlier poems, such as the interlude, *Magnificence*, were of a scholarly character, but latterly he developed a humorous and satiric vein, attacking the

clergy in Colin Clout, and Wolsey in *Why Come Ye Not to Court?* This last effort brought the wrath



John Skelton,
English poet

of Wolsey upon him, but Skelton took refuge in the sanctuary at Westminster, where he remained till his death, June 21, 1529.

His other poems include

The Tunning of Elinor Rummung, full of Rabelaisian humour, The Death of Philip Sparrow, and The Bowge of Court, an allegorical satire. In English literature Skelton stands midway between the Chaucerian school and the Italian influences inaugurated by Wyatt and Surrey. *Consult Poetical Works*, 2 vols., ed. A. Dyce, 1843; Lives, L. J. Lloyd, 1938; N. Nelson, 1939; J. A. Gordon, 1944; H. L. R. Edwards, 1949.

Skerries. Watering-place and seaport of co. Dublin, Eire. It is 18 m. N. of Dublin, with a station on the Eire State rlys. The chief industries are fishing and quarrying, stone being found in the neighbourhood. Pop. 2,306. The Skerries are four small islands off the coast of co. Dublin. The name is also that of a reef about 3 m. off the S. coast of Devon and about 2 m. from Start Point.

Skerriyvore. Rock extremity of a dangerous reef of the Inner Hebrides, Scotland. The reef extends for 8 m. in the W.S.W. direction and is about 10 m. S.W. of Tiree Island. It was the cause of numerous wrecks until 1844, in which year a lighthouse, 150 ft. above high water, was completed. This was built by the brothers Alan and Thomas Stevenson, and after it the latter's son, R. L. Stevenson, named his house at Bournemouth.

Sketch, THE. London weekly illustrated paper. Issued from the office of The Illustrated London News, and started Feb. 1, 1893, it was the first paper of its kind to be illustrated throughout by process blocks. Reflecting the lighter side of life, with special attention to theatres and variety houses, social gossip, etc., its first editor, 1893-1900, was Clement Shorter (*q.v.*).

Sketches by Boz, ILLUSTRATIVE OF EVERYDAY LIFE AND EVERYDAY PEOPLE. The title given by Charles Dickens to selections from his contributions to The Monthly Magazine, The Evening Chronicle, Bell's Life in London, and Chapman and Hall's Library

of Fiction, when, with additions and Cruikshank's illustrations, they were published by Macrone in 1836. A third edition was followed in 1837 by a new series. The Sketches were then issued in monthly parts by Chapman and Hall, who, with the author and John Forster, had acquired the copyright. The pathos and humour of Dickens were as yet far from maturity, but the Sketches were an earnest of his unrivalled descriptive power.

Skewback. In building, a part of an arch abutment with an inclined face. It receives the thrust of an arch projecting beyond the vertical line of the opening.

Skibbereen. Market town, urban dist., and seaport of co. Cork, Eire. It stands on the Ilan, 54 m. S.W. of Cork, with a station on the Eire State rlys. It is also the terminus of a line from Skull. Small vessels can reach the town, but larger ones unload at Old Court, 3 m. away. In addition to the shipping, there is some fishing and a trade in corn, cattle, etc. The district suffered dramatically in the potato famine of 1847: pilgrimages are still made to the graves of the victims, in a graveyard adjoining a ruined Cistercian cell on the outskirts of the town. Market day, Sat. Pop. est. 3,000.

Skiddaw. Mountain of Cumberland, England. It is 3 m. from Keswick and rises to 3,054 ft. On the E. side of the mountain is an extensive and wild tract of moorland called Skiddaw Forest. The ascent of the mountain is easy.

Skiddaw Slates. In geology, a group of sedimentary rocks, mainly slates and sandstones, which occur on the northern edge of the English Lake District, and take their name from Skiddaw, which is composed chiefly of them. They are partly Upper Cambrian and partly Lower Ordovician in age. The Skiddavian Series is the lowest subdivision of the Ordovician. See Cambrian; Geology; Ordovician.

Skien. Seaport of Norway. It is situated on the Skienelv, an arm of Oslo Fjord, 62 m. in a direct line S.W. of Oslo. Founded in the 14th century, it has been frequently rebuilt of timber after destruction by fires. It has rly. connexion with Oslo. There are

paper, saw, flour, and cotton mills, wood-pulp, chemical, and furniture factories. Copper and iron ore are mined in the locality and exported. Ibsen was a native. Pop. 16,300.

Ski-ing (Norw. *ski*, snow shoe). Art of forward movement on ski (*pron. skee* or *shee*). The ski are a form of snow shoe, consisting of boards strapped to the feet, some 90 ins. long, 5 ins. broad in the widest part, and 1½ ins. thick just under the foot. The boards are usually made of hickory. There are many kinds of binding used by means of which the ski is attached to the boot. Tight bindings are most used, because the modern swing turn is quite impossible unless the heels are firmly held.

Ski as a means of progression over snow date back centuries. The earliest mention of ski-ing on record occurs in Procopius (A.D. 526-599), who mentions a race of Skridfinner—that is, gliding Finns—apparently in contrast to other Finns who did not glide. The use of ski was mainly as a method of getting from one snowbound valley to another, and it was not until 1870 that first reference is made to ski-ing as a sport. In 1877 the Christiania ski club was formed, and the Norwegian ski association was founded 1883. The first mention of Continental ski-ing is found in a book published 1689. In England ski were used in Cumberland



Skiddaw. The 3,054-ft. mountain in the Lake District, Cumberland

early in the 19th century, and possibly even before that.

There are three different types of ski-ing: 1, cross-country or *Langlauf*; 2, downhill or *Slalom*; 3, jumping. As well as a sport, ski-ing is practised for pleasure by many holidaymakers. The practice of downhill ski-ing is of comparatively recent date.

The first ski-ing Olympic games were held in Chamonix, 1924. In the same year the Parsenn Derby, the first international downhill race, was run over a course from Parsenn Furka to Kublis, with a vertical descent of 5,500 ft. and 7 m. long. The course was

changed in 1931 and is now run from the Weissfluh to Kublis, a drop of 7,000 ft. and 10 m. long.

For turning at high speed, both ski should be parallel, flat on the snow, very close together, and should rise slightly before the turn.



The body should be swung from the shoulders, keeping the hips rigid, towards the direction in which the skier is turning, and at the same time dropping to a crouch with the knees and body as far forward as possible.

Leading British competitions are the Duke of Kent's cup, the Roberts of Kandahar challenge cup, the British ski championship. The Arlberg-Kandahar and the Parsenn Derby are the two most important Continental events. Ski-ing in Great Britain is controlled by the Ski Club of Great Britain, which was formed in 1903 and has approximately 8,000 members.

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Ski-ing, A. Lunn, 1927; High Speed Ski-ing, P. Lunn, 1935; Ski Français, E. Allais, 1947; Ski (Technique, Competition, Mountaineering), J. Couttet, 1947.

Skimmia Japonica. Evergreen shrub of the family Rutaceae, native of Japan. It is about 4 ft. in height, with alternate lance-shaped, leathery leaves and fragrant white flowers in large clusters. These are succeeded by bright red berries.

Skimpole, HAROLD. Character in Dickens's novel Bleak House. He is an indolent dilettante and poseur, who allows an affectation of irresponsibility and a flow of charming chatter to mask a nature utterly selfish and a persistent habit of sponging on his friends. Dickens originally called him Leonard Skimpole, and in formulating his peculiar conversational



Skimmia Japonica. Clustered berries and leaves of the Japanese shrub. Inset, flowers

deeper layers consisting of protoplasmic cells. The dermis is composed of dense fibrous tissue, which becomes looser in the deeper part and passes into the subcutaneous tissues. It contains the blood-vessels of the skin. The nails are thickenings of one of the layers of the epidermis.

The deeper layers of the skin contain the hair follicles, from the base of each of which a hair grows, passing through the epidermis. Sebaceous glands are small sacs in the dermis, the ducts of which open into the upper parts of hair follicles. They secrete a fatty substance called sebum, which acts as a lubricant to the hairs. Sweat glands consist of coiled tubes in the deepest part of the dermis, ducts from which pass up through the skin to the surface. They are most numerous on the palms and soles. The dermis also contains the minute end-organs of nerves, by which sensations of touch, pain, heat, and cold are excited.

The functions of the skin are to act as a protective covering to the underlying tissues, to assist in regulating the temperature of the body, and to secrete sebum and sweat, so excreting a certain amount of waste material from the body. See Anatomy; Man.

Skink (*Scincus officinalis*). One of a tribe of lizards, which includes about 400 species. Some of them are limbless, but in most genera short limbs are present. The body is bulky and, as a rule, rather smooth, while the tail is short and conical. The true skinks are found in Africa and S. Asia, in sandy districts. See Lizard colour plate.

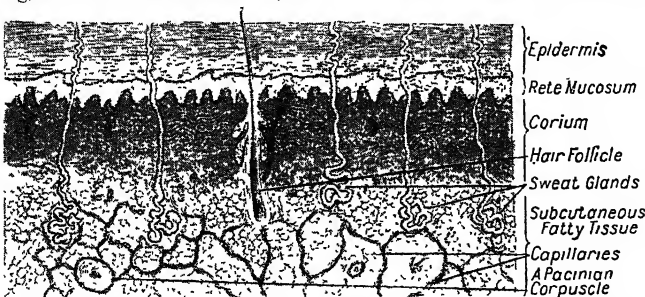
Skinner, JOHN (1744-1816). Scottish prelate. He was born at Longside, May 17, 1744, and educated at Aberdeen university. After ordination in 1763 he was a parish clergyman at Ellon and Longacre, Aberdeen, becoming co-



Ski-ing. A German woman champion demonstrates a turning movement. Top picture shows a ski jump

style openly had Leigh Hunt in mind. To his surprise this gave Hunt some pain, and the alteration of the name to Harold was part of the author's amends.

Skin. Tissue covering the surface of the body. It consists of two layers, the epidermis or cuticle and the dermis or true skin. The epidermis is composed of stratified epithelium, the surface layers being hard and horny, and the



Skin. Diagram of section of the human skin, showing the epidermis and the corium (dermis) or true skin, and indicating the arrangement of the sweat glands and the position of a hair follicle

adjutor to the bishop of Aberdeen in 1782, bishop 1787, and primus of Scotland in 1788. He did important work in promoting the Relief Act of 1792, which removed the disabilities under which the Scottish Episcopalians suffered. He published *A Course of Lectures*, 1786; *A Layman's Account of His Faith*, 1801; *Primitive Truth and Order Vindicated*, 1803. He died July 13, 1816.



John Skinner,
Scottish prelate

Skinner, William (1778-1857). Scottish prelate. Born at Aberdeen Oct. 24, 1778, he was educated at Marischal College and Wadham College, Oxford. He was ordained in 1802 and succeeded his father, John Skinner, as bishop of Aberdeen in 1816, being elected in 1841 primus of Scotland. Skinner exercised great influence in the Episcopal Church, and Glenalmond College was founded during his primacy. He died April 15, 1857. His elder brother, John Skinner (1769-1841), wrote *Annals of Scottish Episcopacy*, 1818.



William Skinner,
Scottish prelate

Skinner's Company. London city livery company. Incorporated in 1327, and arising from a guild interested in the trade in skins cured with the fur upon them, it has had many illustrious members. In its charge are Tonbridge school, founded by Sir Andrew Judd in 1553; a secondary school for boys at Tunbridge Wells, 1887; another at Tonbridge, 1888; a secondary school for girls at Stamford Hill, 1886; and almshouses at Palmer's Green, 1894.

The Skinner's company has done much to promote technical education and its charitable work has been considerable. The hall, 8, Dowgate Hill, E.C.4, once called Copped Hall, rebuilt after the Great Fire of 1666 and since renovated, contains some valuable 16th century plate, and historical paintings by Sir Frank

Brangwyn. See *City Companies*. Consult *Some Account of the Company of Skinners of London*, J. F. Wadmore, 1902.

Skipper (Du., *schipper*). Title of the master of a fishing vessel or small trading ship. The term is sometimes applied to the captains of larger vessels, except in the R.N., where it is used only for a wartime rank of the commander of a drifter or trawler engaged in minesweeping.

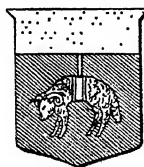
Skipper (Hesperiidae). Family of butterflies of primitive structure approaching moths, and coloured



Skipper. Small British butterfly, the grizzled skipper, *Hesperia malvae*

mostly various shades of brown. The eight British species have a rapid short darting flight—whence their English name. The caterpillars mostly feed on grasses and spin leaves together as shelters. The pupae are enclosed in cocoons of silk and grass. See *Butterfly*.

Skipton (A.S. *scepton*, sheep town). Mkt. town and urban dist., giving its name to a co. constituency, of Yorks (W.R.), England. On a tributary of the Aire, 26 m. N.W. of Leeds, it has a rly. station. The town has cotton and woolen factories and a cattle market. It has a grammar school of the 15th century, and a parish church, Holy Trinity, in Perpendicular style. Skipton grew up around a Norman castle; this was a stronghold in the Civil War, and the damage it suffered, together with that to the parish church, was repaired. In the grounds of the castle, part of which is still used as a residence, are the ruins of the church of S. John. Skipton was the birthplace of some of the Sidgwick family of philosophers. Market days, Mon. and Sat. Pop. est. 13,430.



Skipton arms

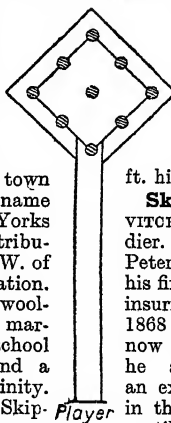


Skipton, Yorkshire. Gateway of ruined castle

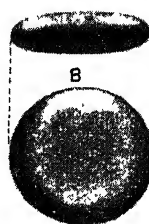
Skittles. Game of great antiquity and wide distribution. Four large pins or skittles are set up in the form of a diamond at one end of a green or alley; a bowl shaped like a cheese and about 10 lb. in weight is thrown at them from a distance of 21 ft. Another pin in the centre of the diamond is called the king pin. The object is to strike the skittles so that all of them shall be knocked over in one or two throws. The cheese is flung on to the skittles, not rolled towards them, a certain amount of physical strength being required. In another form of the game a ball is bowled at nine pins set up in the same manner. A variety played upon a table in public houses is known as bar skittles. See *Nine Pins*.

Skjaeggedals Foss. Norwegian waterfall. It is 9 m. N.E. of Odde on the Tyssaa river in the Hardanger Fjeld, and 525 ft. high, and is much visited.

Skobelev, MIKHAIL DMITRIEVICH (1843-82). Russian soldier. Born Sept. 17, 1843, at St. Petersburg (Leningrad), he saw his first service during the Polish insurrection of 1863, and from 1868 was stationed in what is now Soviet Central Asia, where he also did good work as an explorer. He had a share in the capture of Khiva and a still greater one in the ex-



Player



Skittles. A. Pin. B. Top and side views of the "cheese." Top, left, plan of diamond and alley



Skoda Works. The famous Czecho-Slovakian armament works near Pilsen after Allied bombing during the Second Great War. Top, the advanced stage of rebuilding reached in 1946

Germans invaded Czecho-Slovakia in 1939 they immediately seized the Skoda works for their own armament production. Forced labour was extensively used. The works were bombed from Great Britain and the Mediterranean area, the last attack being made by American aircraft in 1945. Thereafter Skoda production was largely directed to supplying

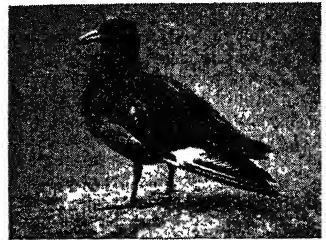
the Russian armed forces.

Skopin. Town of the R.S.F.S.R. It is in the region and 50 m. S. of Ryazan, on the Verda. There is considerable trade in grain, cattle, pottery, and iron wares. The dist. is chiefly agricultural.

Skoplje. Capital of S. Serbia, Yugoslavia. It is 130 m. N.W. of Salonika, is on the Vardar, and is a rly. junction. The Turkish name is Uskub. It is a centre of administration for Muslim activities. The principal buildings are a citadel, the palace of the former Turkish governor, churches and mosques, a Roman aqueduct, a school of agriculture, an institute of tropical diseases, and a university. Agricultural produce consists of maize, oats, barley, and opium, and silkworm culture is carried on. Chrome, antimony, saltpetre, and magnesite are mined in the dis-

trict. The name is derived from Scupi, an ancient town overwhelmed by an earthquake in the 5th century. In the 13th century Skoplje was captured by the Serbian king, Milutin, who made it his capital. It was taken by the Turks in 1912, fell to the Bulgarians in 1915, and was regained by the French in 1918. During the Second Great War it was taken by the Germans, April 9, 1941, and liberated by a combined force of Bulgarians and Yugoslav patriots, Nov. 15, 1944. Pop. 68,334.

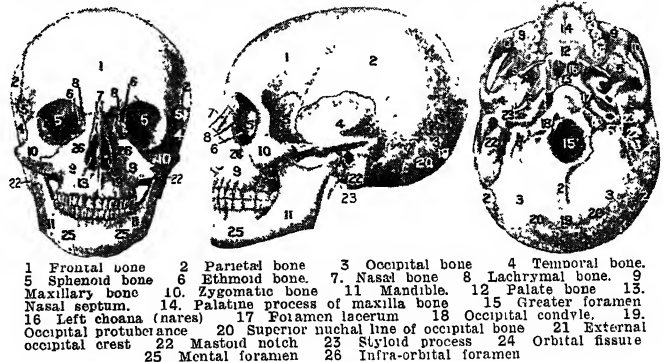
Skua (*Stercorarius*). Genus of gulls, of which four species occur in Great Britain. They have brownish plumage. The common or great skua (*S. skua*) is 25 ins. long and is mottled brown. It breeds in the Shetlands, but is rather rare. Richardson's skua is somewhat smaller and has dusky plumage, except on the neck and under parts, which are yellowish white. The Arctic skua (*S. parasiticus*) breeds in the Orkneys, Shetlands, and Hebrides. The



Skua. Antarctic species of the brown gull
W. S. Berridge, F.Z.S.

long-tailed skua and the pomarine skua are only rare visitors to Great Britain.

Skull. Part of the skeleton. It consists of a cavity, the cranium, which contains the brain, and a bony structure for the organs of special sense, forming the face. In the human species the skull is com-



Skull. Front, side, and view from below of the human skull

petition against Khokand, but made his great reputation during the Russo-Turkish War of 1877. He showed great courage and strategic skill at Plevna, Lovtcha, and especially at Senova in the Shipka Pass. Afterwards he returned to Turkistan, where in 1881 he led the assault on the fortress of Geok Tepe and subdued the country. He died July 7, 1882.

Skoda Works. Manufacturing concern situated at Pilsen, Czecho-Slovakia. Up to the end of 1918 it was one of the world's greatest arsenals and the largest steel works in Central Europe. It was in Austrian territory, and bore the same relation to the Austro-Hungarian govt. as Krupp's (*q.v.*) to the German. By the treaty of 1919 the works passed under control of Czecho-Slovakia.

The Skoda works were started as a small factory in 1859. In 1913 their area, excluding coal mines and proving range for guns, was 360 acres, and employment was given to 7,500 men. The principal departments were the ordnance factory with a shell-filling plant and proof-range, forges for light and heavy work, rly. material plant, steel works, iron and metal foundries, boiler-building shops, bridge-building plant, and general engineering works.

Although the 40,000 workers of 1918 were reduced to a few thousands in 1921, production of armaments was increased after 1930 to supply many weapons used by Germany and France. When the

- | | | | |
|------------------------|---|-----------------------------|------------------------|
| 1 Frontal bone | 2 Parietal bone | 3 Occipital bone | 4 Temporal bone. |
| 5 Sphenoid bone | 6 Ethmoid bone. | 7. Nasal bone | 8 Lacrymal bone. |
| Maxillary bone | 10. Zygomatic bone | 11 Mandible. | 12 Palate bone |
| Nasal septum. | 14. Palatine process of maxilla bone | 15 Greater foramen | 16 Left choana (nares) |
| 18 Left choana (nares) | 17 Foramen iscerum | 18 Occipital condyle. | 19. |
| Occipital protuberance | 20 Superior nuchal line of occipital bone | 21 External occipital crest | 22 Mastoid notch |
| 22 Mastoid notch | 23 Styloid process | 24 Orbital fissure | 25 Mental foramen |
| 25 Mental foramen | 26 Infra-orbital foramen | | |

pressed on the sides, broader behind than in front, and is supported by the spinal column or back-bone. The bones composing the cranium are the occipital, the frontal, the sphenoid, the ethmoid, two temporal, and two parietal bones.

The bones of the cranium are formed of two compact layers known as the inner and outer tables, supported by a layer of cancellate bony tissue. The external surface is smooth, but shows lines formed of small irregular bony processes or sutures where the component bones are united. Internally, the cranium exhibits depressions corresponding to the large convolutions of the brain, shallow grooves along which large veins run, and smaller grooves marking the site of the arteries.

The base of the skull presents a large aperture known as the foramen magnum, through which the brain passes to the spinal cord, and smaller apertures for the passage of nerves and blood-vessels. The bones of the cranium are developed from cartilage, and at birth this process is not complete. Hence soft spots are to be felt. These are known as fontanelles, the largest being on the vertex of the skull. They should be completely closed by not later than the end of the second year. The form of the skull varies widely in different races, skulls relatively wide being termed brachycephalic, whilst the long, narrow type is termed dolichocephalic. See Anthropology, plate; Bone; Brain; Facial Angle; Head; Man; Phrenology; Piltown Skull.

Skunk (*Mephitis*). Carnivorous mammal. Belonging to the weasel tribe, it is found in N. and Central America. It is rather smaller than a domestic cat, and has a handsome black coat with two white stripes running along the back. The tail is long and bushy, measuring 18 ins. when the body is about 24 ins. long. Skunks are commonly found in the open country and near farms, where the hen-roost is a great attraction. Their chief foods are mice, frogs, and



Skunk of Canada, *M. mephitis*
W. S. Berridge, F.Z.S.



Skye Terrier. A champion of this popular breed of dog

birds' eggs, and to a certain extent insects. Their fur is of considerable value. The animal, which can emit an offensive odour from the secretion of a pair of glands near the tail, has been reared in captivity for its fur.

Sky. Apparent arch or vault of heaven, which extends from horizon to horizon. The chief cause of the blue colour of the sky is the scattering of sunlight by the molecules of the air. When light of different wavelengths passes through such a medium containing minute particles the proportion scattered is greater the shorter the wavelength of the light; the short waves at the blue-violet end of the spectrum are thus scattered more than the longer yellow-red waves. If large particles of smoke or dust are present in the atmosphere the scattered light does not contain so high a proportion of blue, and the sky appears whiter in colour. From high mountains the sky assumes a pure deep blue because of the absence of smoke, etc., in the upper regions. See Clouds, colour plate.

Skye. Island of the Inner Hebrides, Scotland. Part of the county of Inverness, it is separated from the mainland by Kyle Rhea, a channel $\frac{1}{2}$ m. wide. From N. to S. it measures 47 m., and its breadth varies from three to 26 m. Its area is 643 sq. m. The coast is deeply indented, and the surface mountainous. The highest hills are the Cuillin range, several being over 3,000 ft. high. The scenery is magnificent, especially in the N. Notable spots are Loch Coruisk, mentioned in Scott's *Lord of the Isles*, and Glen Sligachan, at the head of a loch of the same name.

The chief industries are fishing, the rearing of cattle and sheep, and distilling. Portree, the chief village, has steamer communication with Glasgow, Oban, and elsewhere. Skye was the stronghold of the Macleods and the Macdonalds. Dunvegan Castle was the headquarters of the former. The inhabitants are mainly crofters. Off the coast are a number of small

islands. A Highland gathering for Skye is held every year near Portree. Pop. est. 11,000.

Skye Terrier. Breed of small dog. Formerly kept in the Isle of Skye for destroying vermin, it is now regarded largely as a pet. It has a long low body, with very short legs, and the hair almost touching the ground. Very often the hair on the head is so long and profuse as to obscure the vision. Its height is usually 10 ins., and the length of the body rather more than 30 ins. Two types of Skye terrier are recognized by fanciers. The drop-eared breed should be very long in the body, almost resembling the dachshund, and have long, straight hair. The prick-eared type is shorter in the body, rounder in the head, and should have a rather rough coat. The Skye terrier is extremely alert and intelligent; is docile in disposition; and makes a capital house dog. See Dog, colour plate.

Skylark (*Alauda arvensis*). Bird of the order Passeriformes. It is a native of Europe (including Great



Skylark. British song-bird which nests in the fields and downs
W. S. Berridge, F.Z.S.

Britain) and Central and N. Asia. Its general colour is brown, streaked with black on the upper parts, and buffy white beneath. It measures about 7 ins. in total length, of which a little over 2 ins. is tail. The first primary quill of the wing is exceedingly small, and the hind claw is very long and straight; two points which distinguish the skylarks from other larks. The open nest, constructed of dry grass, is placed in a depression in the ground, and contains 3-5 blotched grey and brown eggs. The food consists chiefly of seeds and insects. The bird is famous for its song in flight. Vast numbers of skylarks from the Continent visit Great Britain in the autumn and stay during the winter. See Bird; Eggs colour plate.

Skymaster. Transport aeroplane designed and manufactured by the Douglas aircraft co. of the U.S.A. First known as the DC-4

airliner, the Skymaster became in the Second Great War the standard four-engined transport of the U.S.A.A.F., in which it bore the designation C-54. The wing span was 117 ft. 6 ins., the fuselage length 93 ft. 11 ins.; it was one of the first large aeroplanes with a nosewheel undercarriage. It was powered by four 1,350 h.p. Pratt & Whitney Twin Wasp radial engines, giving a top speed of 274 m.p.h. The extreme range with normal load of 26 passengers was 3,900 m. In 1947 an automatically controlled Skymaster crossed the Atlantic without a pilot.

Skyro. Alternative name for the Aegean island of Seyros (*q.v.*).

Skyscraper. Building of many storeys. Two pre-requisites of its invention in the U.S.A. were the devices of the hydraulic lift and the steel building framework. These were first utilised to the full in the construction of the Home Insurance building in Chicago (1884) to designs by W. Le B. Jenney (1832-1907). The basic principle was a method of skeleton construction in which each storey was carried independently on columns. The pattern was soon followed elsewhere, especially in New York, where this type of building was especially suitable because of the island site of this great and growing city in which 32 skyscrapers rise to more than 500 ft. The tallest is the Empire State building, with 102 storeys reaching to 1,250 ft.

The advantages of the skyscraper are that it utilises to the full the costly land of crowded cities, and it is convenient since restaurants, shops, etc., may be found in the same building with many offices. On the other hand it is the chief reason for congestion of street traffic at rush hours, since it concentrates several thousands of persons under one roof; also when, as often happens, skyscrapers are built on both sides of a street, they convert it into a canyon, perpetually darkened and stiflingly oppressive through the closeness of the atmosphere when not swept by fierce gusts; and it gravely increases fire hazards. While the individual skyscraper is often aesthetically a disfigurement, a certain combination of skyscrapers may produce a unique artistic effect, especially when lit up at night, as in the skyline of lower New York when approached from the sea. The inconvenience caused by the exclusion of light and air has led many U.S. cities to impose varying height limits.

Slade, Felix (1790-1868). British art collector. Born in Lambeth, London, he became a collector of ancient and modern glass, pottery, old MSS., and engravings. He bequeathed a great part of these to the British Museum, and left £35,000 for the endowment of the Slade professorship of fine arts at Oxford, Cambridge, and University College, London, where also six scholarships and the Slade school (*q.v.*) were established. The Oxford professorship, together with that of poetry, was discontinued from 1914. Slade died in London, March 29, 1868.



Felix Slade, British art collector

Sladen, Douglas Brooke Wheelton (1856-1947). British writer. Born in London, Feb. 5, 1856, he was educated at Cheltenham and Trinity College, Oxford. Professor of history in Sydney university, 1882-84, he travelled extensively, and became an authority on Japan. He planned *Who's Who* in its new form in 1897, and edited it until 1899. In 1938 he was chairman of the Modern Girl club. He died Feb. 12, 1947. More than 60 books by Sladen included *Frithjof and Ingebjorg*, 1882; *Austrian Ballads and Rhymes*, 1888; *A Japanese Marriage*, 1895; *In Sicily*, 1901; *The Secrets of the Vatican*, 1907; *The Douglas Romance*, 1916; *Eve, an Artist's Model*, 1932; *My Long Life*, 1939.

Slade School. School of fine arts, a branch of University College, London. Founded by the bequest of Felix Slade (1790-1868), it was opened in 1871, with Sir E. Poynter as its first professor, and has professors of painting and sculpture, and lecturers in the history of art, anatomy, ornamental design, and perspective. Other principals have included Henry Tonks and Randolph Schwabe (the latter died in 1948). The many famous painters who studied at the Slade include Augustus John, Orpen, Wyndham Lewis, and Paul Nash. *Consult* The Slade, J. Fothergill, 1907.

Slag. Non-metallic metallurgical material. It is produced during almost all operations involving the handling of molten metals. Composition varies with the impurities present, refractories in the furnace, etc. In smelting, the function of slag is to collect the unwanted gangue constituents of

the ore, so as to leave the metal or matte as pure as possible. As silica is the most abundant impurity in ores, the majority of slags are silicates. A desirable slag will melt readily to form a fluid, easily handled mass; be lighter than the molten metal; not attack the refractory linings of the furnace; and protect the metal from the furnace atmosphere. This is effected by the addition of suitable fluxes. Slag often has value as a by-product; e.g. basic slag from steel making is a common fertiliser.

Slagelse. Town of Denmark. It is in Zealand, 58 m. S.W. of Copenhagen, and has rly. connexion with the capital and with Korsør. The church is an ancient foundation, and there is a ruined monastery. Hans Andersen attended the high school. Pop. est. 18,073.

Slaitwaite. Former urban dist. and market town of the W. Riding of Yorks, England, since 1937 forming part of the Colne valley urban district. It stands on the river Colne, and is served by rlys. and by the Huddersfield canal, Huddersfield being 4 m. N.E. There are manufactures of woollen and cotton goods, and the place is visited for its baths, the waters being efficacious for skin diseases. Market day, Mon. (alternate). Pop. 5,000. The name of the town is locally pron. Slah-wit.

Slander (Lat. *scandalum*, scandal). Malicious defamation of a person in his character, business, or profession by spoken words as distinct from written words, which is libel (*q.v.*). It is a less serious offence than libel as being less permanent and far-reaching, and exposes the offender only to civil proceedings. Action will lie if the words impute a criminal offence, if they allege misconduct in a public office, if they reflect upon another's trade or profession, or if they cause special damage. Any imputations on a woman's chastity are actionable without special damage under the Slander of Women Act, 1891.

Slaney. River of Eire, in the prov. of Leinster. It rises on the slopes of Lugnaquilla, co. Wicklow, and flows 60 m. S.W. and S. through counties Carlow and Wexford to Wexford Harbour. It receives the waters of the Bann, Derry, and other rivers. The town of Wexford, at its mouth, has a salmon fishery and river traffic between itself and Enniscorthy.

Slang (*cf.* Norwegian *slengja*, to sling, cast). Vulgar or colloquial form of speech not recognized in

the literary language of the period. The earliest sense of the word, which held its ground till the middle of the 17th century, is the cant or jargon peculiar to rogues and vagabonds and intelligible only to themselves. Subsequently the respectable trades and professions adopted a jargon of their own, also known as slang, made up of colloquialisms and characterised by unauthorised or humorous metaphorical applications of legitimate expressions. When these expressions meet with general acceptance in their altered sense, their original eccentricity is forgotten, they cease to be slang, and take their place in the storehouse of the literary language. Cant or pedlars' French appears to have assumed definite shape soon after the arrival of the gypsies in England early in the 16th century.

Sources of Slang Words

This language was naturally of mixed origin. Irish and Gaelic words made their way into it through shelta, tinkers' slang; Romany, which in the main consists of Hindi and Persian, contributed a number of words, though not so many as might have been expected; in the time of Elizabeth many additions were made from Italian. Later slang was also considerably indebted to Dutch, the result of the great influx into England from the time of William III. After the time of Charles II the new kind of professional slang developed, in consequence of the great advance of the arts and sciences. In more recent times slang has been increased by Yiddish (Hebrew-German), extensively spoken in the East End of London; Anglo-Indian, pidgin-English (*q.v.*), and Americanisms have played their part.

All countries possess a slang of their own; such are the French argot or langue verte, the German Rotwelsch (beggars' lingo), the Italian gerga, the Spanish germania, the American gangster idiom. Minor kinds are back, rhyming, university, and public school slang. To illustrate the extent to which slang has affected different classes of society, a dictionary of the subject arranges slang under various headings—fashionable, parliamentary, military, religious, legal, literary, theatrical, civic, money, shopkeepers', workmen's, oaths.

A fruitful source of slang is metaphor, the use of a name or descriptive term in reference to something to which it is not really applicable—*e.g.* "mug" for "face," perhaps

originating in the 18th century habit of making drinking mugs to represent a human face with distorted features. Metaphor is responsible for phrases like a "blooming" error, which is regarded as slang, whereas no objection is taken to a "glaring" error. Other sources are neologisms, new words of native or foreign origin, and the use of old words with different meanings; euphemism, the substitution of a less disagreeable phrase for one that is offensive to the susceptibilities of others, as "to go west," in the sense of "die." In both Great Wars hundreds of new slang words were invented by the British fighting services; some were common to all, while others were peculiar to one service. Much service slang, especially from the R.A.F., passed into civilian speech. See Rhyming Slang. Consult Dictionary of Slang and Colloquial English, J. S. Farmer and W. E. Henley, 7 vols., 1905; Words, Words, Words, E. Partridge, 1933.

Slapton. Village in Devon, England, 7 m. S.S.W. of Dartmouth. It has a 14th century tower and a church dating from the 15th century. For nearly 20 years it was the home of Sir John Hawkins. During the Second Great War, Slapton Sands in Start Bay were used by American land and sea forces as a training ground for the invasion of the Continent. On July 7, 1945, the American authorities unveiled a monument expressing gratitude to people who evacuated their homes during the training.

Slate. Fine-grained rock, possessing exceptionally good cleavage, and produced by the metamorphism (*q.v.*) of pre-existing rocks. Most slates are formed by pressure at the end of a period of folding. The pressure influences the development of new minerals so that they grow normal to the direction of compression; flat and flaky minerals such as chlorite and sericitic mica tend to develop, and a direction of cleavage appears. Shales and mudstones are the rocks most readily converted into slate, but volcanic ashes and lavas can also take on a perfectly good cleavage, as in the Lake District. This cleavage is usually at an angle to the bedding planes of the strata, and is commonly parallel to the axial planes of the folds into which the beds have been thrown. Slates are found in all geological epochs to the Tertiary and many contain fossils.

Good slates are hard and durable, compact, do not split easily from

exposure to changes of temperature or to moisture, and are usually grey-black to blue-black in colour, though green, red, and mottled varieties are found. Its lightness, the ease with which it is split into thin sheets, and its weathering properties make slate an excellent roofing material.

Slates come from N. Wales, the Lake District, Delabole in Cornwall, Scotland, parts of Ireland, many parts of Europe, and N. America. When quarried the slates are cut up into sizes known as princesses, duchesses, countesses, and ladies, varying from 24 ins. by 14 ins. to 9 ins. by 6 ins. In addition to their use for roofing purposes slates are wanted for billiard tables, cisterns, mantelpieces, slate pencils, writing slates, blackboards, etc. See Shale.

Slate Club. Association of persons who pay weekly contributions into a common fund, from which they can draw limited sums to meet emergency demands. At the end of the year, usually just before Christmas, the balance of the fund is distributed among the members. Slate clubs are so called because originally the sums were chalked up on a slate.

Slater, OSCAR. German Jew convicted at Edinburgh, May, 1909, of the murder of Miss Gilchrist, an octogenarian living in Glasgow, who kept £3,000 worth of jewels in her bedroom. On Dec. 21, 1908, Miss Gilchrist was found lying on the dining-room floor, murdered. A girl named Barrowman saw a man escaping from Miss Gilchrist's residence, and afterwards identified Slater as the man she had seen.

Oscar Slater fled to New York a few days after the murder and was arrested there. The identification of Slater aroused a conflict of evidence. Sir Arthur Conan Doyle maintained his innocence, but in June, 1914, an inquiry reported that there was no evidence of a miscarriage of justice. Meanwhile, in 1909, he had been condemned to death, but the sentence had been commuted to penal servitude for life.

In 1927 Slater was released; in 1928 the Scottish court of criminal appeal, set up two years before, set aside his conviction, and the govt. accorded him an *ex gratia* payment of £6,000. A special Act of parliament had been passed in order that the case could be reviewed. Slater died, at the age of 75, Jan. 31, 1948. Consult Oscar Slater, ed. W. Roughhead, 1910; The Case of Oscar Slater, Sir A. Conan Doyle, 3rd ed. 1914.

Slatin, SIR RUDOLPH KARL VON (1857-1932). Austrian soldier. Born near Vienna, June 27, 1857, he served in the Austrian army until 1878, when he went to Egypt and joined the forces there. In 1884 Gordon made him governor of Darfur, but almost at once he was taken prisoner by the Mahdists and remained a captive for eleven years. In 1895 he escaped and rejoined the Egyptian army, with which he served in the Dongola and Omdurman campaigns. During 1900-14 he was inspector-general in the Sudan under the British, but on the outbreak of the First Great War he joined the Austrian Red Cross. He was a member of the Austrian peace delegation in Paris, 1919. He was created a Baron of the Austrian Empire, 1906, having been made K.C.M.G. in 1898. He wrote *Fire and Sword in the Sudan*, 1896. He died Oct. 4, 1932.

Slatting. Roofing of buildings with slates. The commonest way of slating is to nail the slates to laths which in turn are fixed to the rafters of the roof. This form of slating cannot be relied upon to keep out snow, however, and a better method is first to cover the rafters with felt or three-ply Willesden paper. The slates are then laid directly on this, or to laths. An air space keeps the roof at a more uniform temperature, and the laths are often placed over battens nailed on to the felt. *See* Roof; Slate.

Slaughter House. Place designed for the killing of cattle and other animals. *See* Abattoir.

Slav. Name of a group of peoples, mostly in E. Europe. It is applied primarily to people speaking dialects of the Slavonic sub-family of Indo-European languages. There is no homogeneous Slav ethnographical group. The name is by some writers derived from a native word meaning speech.

The first definite reference to the name dates from the 6th century A.D. Some Slav peoples, such as the Venedae and Serbs, were known to classical geographers at the beginning of our era, and Slav elements emerge still earlier in certain tribal groups of the Scythian region described by Herodotus. Their protohistoric cradle-land, wherein they established their most typical characteristics, lay N. of the Carpathians.

They eked out their indifferent crops by fishing, and hunted animals, with whose pelts they were clad. They brewed mead. There

being no dry grasslands, they lacked cattle and milk food. Their social organization was based on a primitive patriarchal rule, with chiefs elected by the local assembly. In warfare they fought afoot, with javelins and shields.

The W. and S. migrations of the Germanic populations in the 3rd-4th centuries conduced to, if they were not actually occasioned by, the expansion of their Slavonic-speaking neighbours. By the 6th century Slav communities occupied Poland, the Elbe basin to the Baltic coast, the region between Saale and Oder, and the Bohemian uplands. Berlin, Breslau, Dresden, Pomerania, and numerous other Slavonic place-names attest the extent of their dispersion. Towards the S. they crossed the Danube and overran the Balkan plains. Although driven back by the Avars, their settlements imparted to the peninsula that Slav predominance it still retains.

The Slav populations, political rather than ethnic communities, number: Poles, including Kashubs, 20,000,000; Czechs, Slovaks, and Wends, 10,000,000; S. or Yugo-Slavs and Bulgars, 20,000,000. There are about 8,000,000 in America.

Slavonic languages pertain to the E. or Aryan branch of the Indo-European family. As such they use sibilants where gutturals occur in the languages of the W. branch. Some of their inflexions have outlived the Teutonic and Celtic; nouns have three numbers and seven cases, and the numerals are declined. The "aspects" of the verb express subtle distinctions. Russians, Bulgarians, and Serbs use a modified form of the Cyrillic alphabet. *See* Cyril and Methodius; Pan-slavism; Russia.

Slave. River of Canada. It forms part of the Mackenzie river system and is the connecting link between Lake Athabaska and the Great Slave Lake, receiving the Peace river 20 m. N. of Lake Athabaska. At Grahame Landing the river drops over a series of rapids to Fort Smith, the head of navigation from the Arctic Ocean. Below this the river flows for 190 m. over a lowland to the Great Slave Lake. Its length is 306 m.

Slave Coast. Name applied to a portion of the coast of W. Africa between the Gold Coast and the river Benue. The littoral is divided between Togoland, Dahomé and Nigeria. *See* Africa.

Slave Labour. Term used during the Second Great War for the millions of Jews. Poles,

Russians, French, Dutch, Norwegians and others, who were removed by the Germans, usually forcibly, from their homes and put to work under conditions of slavery in the factories, mines, and underground workshops of Germany. Hundreds of thousands of these people, their usefulness as workers exhausted by bad conditions, long hours, and poor food, were sent to the death camps of Poland; from those who survived came the majority of the Displaced Persons (*q.v.*) whose resettlement constituted a major international problem after the end of hostilities.

Slavery (Med. Latin *sclavus*, a Slavonic captive). Economic institution under which forced labour is used without pay. Though supported by his owner, the slave is often a chattel. Slavery is not always distinguished from serfdom, a term which should strictly be applied to the house slaves of Africa, who are members of the owners' families, and cannot, as a rule, be sold.

Slaves fall broadly into the two classes of domestic and industrial slaves. In the lower civilizations—those of agricultural and pastoral tribes—slavery is a widespread institution. It is rare with hunters and nomads.

As regards origin, slaves may be divided into four classes: (1) captives of war, with whom may be grouped kidnapped persons; (2) debtors and criminals; (3) those who have sold their own persons, or have been sold as children by their parents; (4) the offspring of slaves. A great slave-owning area is necessarily either itself warlike or in communication with warrior tribes whose captives come into the market.

In negro Africa most classes of slaves are found. A male slave must work for his owner on certain days, at other times he cultivates his own farm. Any surplus he may convert into currency. A slave may become his master's heir, or guardian of his sons.

In ancient India slaves were inherited, captured in war, purchased, or condemned criminals. Hebrew slaves, if native, were set free in the seventh year, but might be redeemed by their relatives.

In ancient Greece and Rome the economic importance of slavery was enormous. In the 5th century B.C. half the population in Attica was unfree, and a much larger proportion has been given for the Roman empire under Claudius. Slaves in Greece were

employed on domestic duties, in farms, mines, and factories. There were also temple slaves. In general, their condition was good; custom recognized their marriages, permitted them to save money, purchase their freedom, and exercise religious rights. Even the law provided redress against cruel owners who had no power of life and death; escaping slaves had a right of asylum. Domestic slaves, often on terms of friendship with their masters, were better treated than industrial slaves. A slave might purchase his liberty or be set free, and became a client as regards his master, a "metic" or resident alien as regards the state, or by vote receive full citizenship.

Roman Slaves

In Rome slaves were employed in the house, on estates, where they afterwards became *coloni* or serfs, as gladiators, actors, teachers, and in the law courts, etc. Their lot was hard, especially on farms, where the *villicus*, or overseer, was himself a slave. The owner had power of life and death, the slave had no civil rights, could hold no property, and his marriage was not recognized. But by hard work and economy he could purchase his freedom in six years, and in many respects custom mitigated the law. The expansion of the empire increased the number of slaves. When wars of conquest ceased in the 2nd century A.D., the supply of slaves was subjected to many limitations, and in time slaves became serfs.

The civilization of the ancient world was based on the institution of slavery, and without this economic foundation neither Athenian culture nor the Roman imperial system could have existed. It was, however, a chief cause of social and moral decay. Christianity did not forbid slavery, but commended manumission. It supplied the spiritual solvent which gradually destroyed the institution. The manumission of slaves profoundly modified the population of S. Europe. By the 12th century the enslavement of Europeans in Europe had almost disappeared, becoming only a legal penalty for particular offences, generally for a limited period, e.g. penal servitude in galleys.

Among Mahomedans a slave is either a captive infidel or the child of a female slave. Oriental rulers often raised slaves to high positions of confidence, and formed regiments or armies of slaves, e.g. the mamelukes and janissaries.

Powerful dynasties were established by slave captives.

After the discovery of the New World, negro slavery was introduced into all the tropical and semi-tropical colonies. English criminals and political prisoners were sent as slaves to the plantations in the 17th century, and the kidnapping of English children for sale there did not cease until 1744. From about 1650 the European conscience was gradually roused to a sense of the injustice and moral evils of slavery, the Quakers being among the first to protest. The suppression of the slave trade (v.t.) 1807, was followed by that of the whole system throughout the British Empire in 1834. Slavery is now nominally extinct in all civilized countries, although in several parts of the world there exist systems of indentured labour which are scarcely distinguishable from it. See Anti-Slavery Movement; Negro; Peonage; Serf; United States.

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Slave Trade. Traffic in human beings for the purpose of forced labour. In most countries where slavery prevailed the demand was not fully supplied by the small natural increase of the slave population. Where the slave-owning state could not rely on a steady supply of prisoners of war, other warlike tribes enriched themselves by organizing raids, and trading in their captives. The Arabs were for centuries active slave-dealers, and supplied the markets of W. Asia from tropical Africa. The corsairs of N. Africa carried on an extensive trade in slaves, even raiding Ireland and Iceland in the 17th century.

The modern European traffic in negroes was begun by the Portuguese in 1442, but was developed only after the discovery of America. As Spain had no tropical African possessions, the trade was in the hands of the English, French, and Dutch. By the treaty of Utrecht, 1713, Spain concluded an exclusive contract, called the *Asiento*, with the English traders to supply her colonies with slaves. During the 18th century the trade attained great dimensions, and brought rich profits to the traders, in spite of the enormous mortality, two or more slaves being

embarked for one who became an effective labourer. The native chiefs on the Slave Coast, in the Cameroons, Angola, etc., waged constant wars in the hinterland to supply the markets at the ports, the result being the rapid demoralization and ruin of large areas.

In Great Britain, after a long struggle, Lord Grenville's Act for the abolition of the slave trade was passed in 1807. The corsairs of Algiers were suppressed in 1816. The Sudan remained a great source of supply for the Turkish, Egyptian, and Persian markets, but in 1869 the Egyptian government employed Sir H. Baker and afterwards C. G. Gordon to put down the traffic in the Egyptian Sudan carried on by Arab slave dealers, who were devastating that region. The partition of Africa between the powers virtually ended the trade by the close of the century. See Anti-Slavery Movement; Anti-Slavery Society; Slavery.

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Slaviansk, OR SLAVYANSK. Town of Ukraine S.S.R. It is 110 m. S.E. of Kharkov, in the valley of the Donetz. In the neighbourhood there are numerous salt lakes, the place being famous for its saline baths and salt-works. In German hands from the end of Oct., 1941, Slaviansk was liberated Sept. 6, 1943, during a rapid but hard-fought Russian advance in the Donetz basin. Pop. 75,542.

Slavin, FRANK PATRICK (1862-1929). British pugilist. Born in New South Wales, Jan. 5, 1862, he became a professional boxer, and between 1885 and 1891 beat Tom Burke, Mic Dooley, "Chesterfield" Goode, Jim Young, Joe McAuliffe, and Jake Kilrain. On Dec. 23, 1889, he fought a draw, under prize ring rules, with Jem Smith, at Bruges. At the National Sporting Club, on May 31, 1892, Slavin was knocked out by the negro Peter Jackson in the tenth round after a game display. Slavin subsequently won several contests in the U.S.A. and also in the Klondike. He died Oct. 18, 1929.

Slavonia. Dist. of Yugoslavia. Formerly in Hungary, it was the area between the Drave and Save rivers mainly inhabited by Serbs,

and formed part of the semi-autonomous Hungarian prov. of Croatia-Slavonia (q.v.). In the reorganization of the South Slav state the dist. became the autonomous prov. of Syrmia (q.v.).

Sleaford. Market town and urban dist. of Lincs, England, the administrative capital of Kesteven.



Sleaford, Lincolnshire. West front of the parish church of St. Denis

It stands on the Lea, 112 m. from London and 21 m. from Lincoln, and is a rly. junction.

The chief buildings are the church of St. Denis, and Carre's grammar school founded in 1624. The former has a beautiful nave, a Perpendicular rood-screen, and a strikingly decorated font. Sleaford is an agricultural centre; the chief industries are malting and seed production. Sleaford was originally a Roman station, afterwards passing to the bishop of Lincoln. One of the bishops built a castle here, which was pulled down in the 17th century. In the Middle Ages the town had fairs, markets, and trade guilds. Market day, Monday. Pop. 7,610.

Sledge. Carriage with runners made for sliding upon snow. It is more usually spelled sleigh. A sledge-hammer is a heavy hammer. See Hammer; Sleigh.

Sleep. Recurring period of mental and physical rest of an organism during which consciousness is abolished except for partial interruptions while dreaming. During sleep the volume of blood in the brain is diminished, the pupils are contracted, the pulse rate is reduced, the respiratory movements are slower and deeper, and the temperature falls slightly. The cause of the phenomenon is, however, not fully understood, though its duration can be, in some people, controlled at will.

Sleeper. Device for strengthening and preserving the permanent way of a rly. line. Sleepers, which rest on the ballast and carry the rails, are in Great Britain usually of wood, 9 ft. long, 10 ins. wide, and 5 ins. deep. See Railways.

Sleeping Sickness. Disease due to infection by an organism of the genus *Trypanosoma*, prevalent along the W. coast of Africa, the Congo, Uganda, Rhodesia, and other parts of Africa. The parasite occurs in antelopes and other animals, and in domestic dogs. From these it is conveyed to man, and from man to man by the bite of certain tsetse flies.

The symptoms begin usually within two or three weeks with an attack of fever and rash on the skin. The lymphatic glands become enlarged. The fever lasts for about a week, but recurs at intervals. After some weeks or months the patient becomes dull and apathetic. He neglects his work, may be dirty in his habits, and has some difficulty in walking. He prefers to lie quiet instead of exerting himself. Sleep may be excessive, but the condition is more one of lethargy from which the patient can be aroused. Tremors of the limbs occur, there may be shaking of the whole body, and the patient shuffles in his walk. Gradually the muscles become rigid, the patient loses flesh, and the legs may be drawn up against the abdomen. Extreme emaciation occurs, and ultimately death follows from exhaustion.

Preparations containing arsenic have been found of some value in treatment. Preventive measures consist in segregating the sick, where possible, in districts away from the tsetse fly or unfavourable

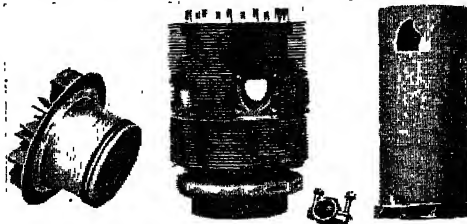
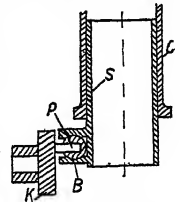
by painting the part affected with tincture of iodine. For the disease popularly called *sleepy sickness*, see Encephalitis.

Sleet. Falling rain and snow or partially melted snow. It occurs, probably, when falling snow passes through air warmer than 32° F., and reaches the ground in a half-liquid state. See Snow.

Sleeve. Covering for the arm. Sleeves vary greatly in different periods, and few parts of dress so precisely indicate the time to which costume belongs. The Normans wore long, loose sleeves reaching far beyond the hand, and the 15th century was also remarkable for great length of sleeve. Some fell loose from the shoulders, or had a slit at the elbow through which the arm was thrust, and sometimes the ends were so long that they had to be knotted or tied together behind to prevent inconvenience. See Costume; Cuff.

Sleeve Valve. The earliest type of this valve, invented by C. Y. Knight about 1905, consisted of two concentric sleeves sliding axially in the bore of a petrol engine cylinder. Each sleeve was driven by a separate eccentric, the relative angular positions of these eccentrics being arranged so that openings in the sleeve communicated alternately with induction and exhaust ports in the cylinder. Fitted to Daimler engines in 1909, the device gave good results, but disadvantages became apparent as revolution speeds and mean effective pressures increased.

The single-sleeve valve (Figs. 1 and 2)



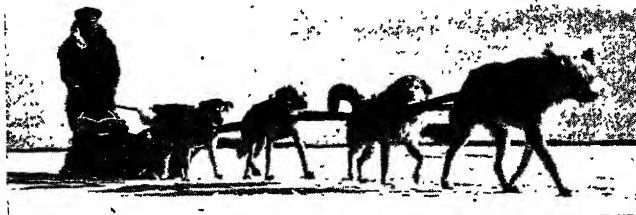
Sleeve Valve. Fig. 1, the valve developed by the Bristol Aeroplane co. Right, fig. 2, sectional diagram. See text

for the development of the trypanosoma in the fly, clearing the bush near villages and along the water's edge at landing places and fords, avoiding bites by wearing appropriate clothing, and immediate disinfecting of a bite

was invented in 1909 by Burt and McCallum, working independently. It consists of a sleeve S, making both sliding and rotary oscillations in the cylinder C. The combined motion puts ports in the sleeve in communication with induction and exhaust ports in the cylinder at the correct positions of the engine crank. The sleeve is actuated by a pin P fixed to a wheel K which is driven at half crank speed through gearing. In the latest type, developed by

the Bristol Aeroplane co. in conjunction with (Sir H.) Ricardo and (Sir Roy) Fedden, a spherical bush B, fitted to a lug on the sleeve S, permits of free sliding and rotary motion of the pin P. Substitution of single-sleeve valves for poppet valves has the following advantages: (1) more silent operation; (2) fewer working parts; (3) all working parts enclosed; (4) higher mean effective pressures practicable, with consequent reduction of weight per h.p.; (5) cooler exhaust; (6) little maintenance required; (7) wear involves replacement of sleeve only; (8) higher revolution speeds practicable, combined with high volumetric efficiency.

Sleigh or **SLEDGE** (Mid. Eng. *sledé*, akin to slide). Wheelless vehicle used on ice or snow. Built on runners, sleighs vary in size and shape according to their use. In countries which are snow-



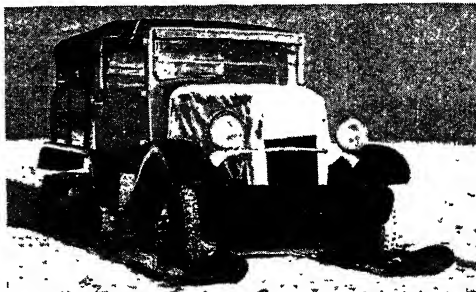
Sleigh. A team of dogs drawing a sleigh in N. Saskatchewan, Canada. Top, a motor tractor converted into a sleigh in readiness for an American Arctic expedition

bound during the winter sleighs drawn by man-power, horses, reindeer, or dogs are the only means of transport, and are adapted for heavy draught purposes, or built on light and graceful lines for use as private conveyances, as in Russia and Scandinavia, or for racing, as in Switzerland, etc. See Bobsleigh; Reindeer; Tobogganing; Troika.

Slessor, **SIR HENRY** (b. 1883). British judge. He was educated at Oundle, St. Paul's, and London university, and in 1906 became a barrister, specialising in trade union law. In 1924 he was knighted, took silk, and was appointed solicitor-gen. in the first Labour govt., being Labour M.P. for S.E. Leeds, 1924-29. He was a lord justice of appeal 1929-40 and, a strong Anglo-Catholic, vice-president of the Church Union Himself a J.P., he favoured a professional, instead of a lay, magistracy. In addition to a legal work on Trade Union Law, 1922, he published *Religio Laici*, 1929; *The Pastured Shire and Other Verses*, 1935; *Judgement Re-*

served (autobiography), 1941; *History of the Liberal Party*, 1944; *Order and Disorder*, 1945.

Slessor, **MARY MITCHELL** (1848-1915). Scottish missionary. Born at Aberdeen, Dec. 2, 1848, she worked as a mill-girl in Dundee, and later was trained for mission work. In 1876 she was sent as a missionary of the Free (later United Free) Church of Scotland to South Nigeria. Her



the university. Attached to the territory are several islands in the Baltic and the North Sea. Both duchies, Slesvig (Ger. Schleswig) and Holstein, came under the Danish crown in 1386, and in 1460 were decreed inseparable. Frequent breaches of this promise led to fighting through the centuries, especially in 1848 and 1864. From 1866 the duchies were united with Germany; but after the First

Great War a plebiscite gave N. Slesvig again to Denmark. The country is flat, with mostly rich soil, whereon horse and cattle breeding have reached the highest standard in Germany. There is fishing in both seas and the numerous inland lakes; grain

and sugar beet are grown; textile, leather, engineering, shipbuilding, and tobacco industries are normally prosperous. Of a pop. (1950) of 3,000,000, 42 p.c. were refugees. See Holstein; Kiel.

Slesvig-Holstein Question.

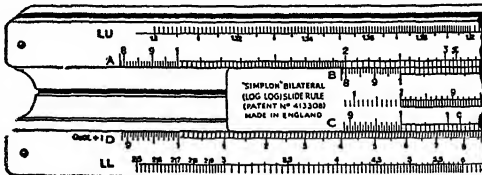
European difficulty which largely caused the Seven Weeks' War of 1866 between Austria and Prussia. Both duchies, Slesvig and Holstein, were ruled by the king of Denmark, although not part of the Danish kingdom proper. In each, but especially Holstein, there was a numerous German population, and Holstein was a member of the German confederation set up in 1815. Moreover, the two duchies had been in 1460 declared inseparable.

Frederick VII, who became king of Denmark in 1847, was without sons, and in the duchies, unlike Denmark, the Salic law was recognized. Frederick claimed that his domains should pass together on his death, whereupon the Holsteiners revolted, and a Prussian army entered the duchies in their support. The Great Powers interfered, and the Prussians withdrew.

knowledge of native dialects was recognized by her appointment as British consul for the Okoyong prov. She died in Old Calabar, Jan 15, 1915. *Consul's Life*, W. P. Livingstone, 1916.

Slesvig. District in Jutland, Denmark. The treaty of Versailles specified that a plebiscite should be taken to determine the frontier of Germany and Denmark after the First Great War. The people in the N. portion of the Prussian prov. of Slesvig-Holstein (*v.i.*) voted for incorporation in Denmark, and this took effect from July 9, 1920, their territory being organized as the S. Jutland provinces. See Denmark map, p. 2650.

Slesvig-Holstein. Until 1945, a Prussian province; later the northernmost German Land, in the British zone, bordering Denmark. Area 6,047 sq. m. Kiel is the capital, biggest city, and seat of



Slide Rule. The instrument which enables arithmetical computations to be made rapidly by mechanical means and logarithmic methods. The slide rule incorporates four principal scales, A and D on the rule, and B and C on the slide. In the illustration in this and facing p.—

The difficulty over the Danish succession was soon adjusted, and Christian, afterwards Christian IX, was recognized as the future king. His succession was guaranteed, as was the integrity of Denmark, by the treaty of London of 1852. But in 1855 a new constitution created alarm in the duchies. With the associated duchy of Lauenburg they had been promised self-government, but instead of this privilege the authority of Denmark over them was emphasised.

The two tendencies, Danish and German, still clashed. In 1863 Frederick VII denounced the treaty of London, and declared his intention of incorporating Slesvig with Denmark. A little later he died and Christian became king, but a rival appeared in Frederick of Augustenburg, who was supported by the Holsteiners. Prussia then interfered, declaring for the right of the duchies to self-government under Christian. Austria consented to act with her. A conference was called to London, but it failed to end the dispute, and the war began in 1864. The Danes were beaten, and the duchies ceded to Austria and Prussia. They quarrelled over the spoil, and with the victory of Prussia in 1866 Slesvig-Holstein became part of that kingdom. See Europe; Seven Weeks' War.

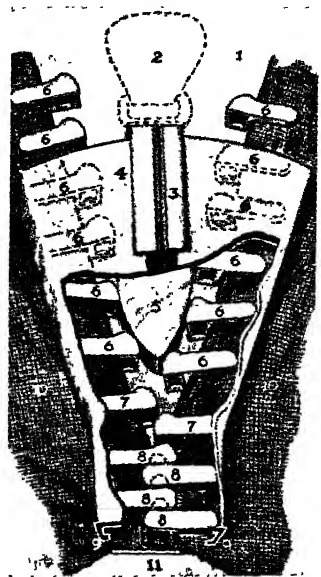
Slide. In photography, device for holding cut film or plates in a camera. After focusing, the focusing screen is removed and the dark slide, with the sensitive material, inserted in its place. Slides usually hold two films or plates, arranged back to back; some are in two hinged leaves which open like a book. A shutter at the front of the slide temporarily excludes light while it is being inserted.

Slide Fastener. Device for closing a garment or bag. Several metal members are clamped to a length of cord, and the latter is sewn on to a fabric tape. Two lengths of tape are stitched one on either side of the aperture to be closed. Each metal member has

on one side a concave recess and on the other a rounded projection; on either side of the opening a projection is opposite a recess. At the end of the lengths of metal members is a slider, the edges of which are lipped and lap over nicks on the outer sides of the metal members. When the slider is drawn the length of the aperture to be closed, the tapes are brought together, causing the projection on one metal member to engage in the recess on that opposite, and vice versa; the members are thus interlocked. For opening there is a heart-shaped piece of metal loosely fixed in the centre of the slider. When the latter is pulled backwards, the pointed end of the heart-shaped piece engages slightly below the locked projections and recesses, disengaging them.

The first practical slide fastener was introduced in 1893 by an Alsatian mechanic, Henri Aronson. His invention was developed by an American firm, but not until 1920 was machinery devised for mass production of the components. The fastener was introduced in Great Britain in 1925 as a fastener for tobacco pouches. There are different types of slide fasteners, one being commercially marketed as the "Zip," but basically their principle is the same.

Slide Rule. Instrument for performing mechanically multiplications and divisions and other mathematical operations by logarithmic methods. In the use of logarithms the multiplication of two quantities is effected by adding their logarithms, the division by subtracting them. This principle is employed in the slide rule, which in effect adds or subtracts logarithmic distances on the scales marked on the rule and on its slide. The principle of the rule is due to Gunter (1620); the slide was added by Wingate, 1626, and the cursor by Mannheim, 1851. The latter is a sliding glass or other transparent member having a datum line engraved upon it; it can be slid along to indicate any



Slide Fastener. 1. Open. 2. Tab. 3. Slide to hold tab. 4. Outer casing of fastener. 5. Wedge that causes teeth to disengage. 6. Teeth disengaged. 7. Teeth about to be disengaged. 8. Teeth engaged. 9. Channel or sides of fastener causing teeth to engage. 10. Fabric. 11. Closed

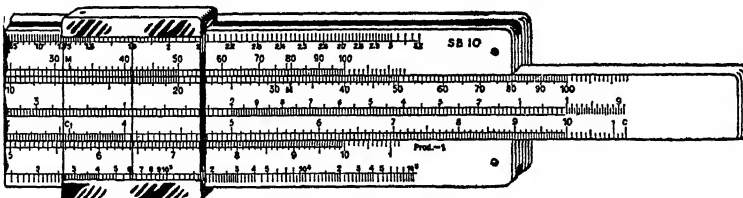
Courtesy of The Illustrated London News

point desired on the scale, enabling results to be read more quickly.

The normal slide rule has a scale 10 in. long; others with 5-in. and 20-in. scales are made. The Fuller calculator works on the same principle, but is cylindrical in form (length 17 in. and diam. $3\frac{1}{4}$ in.); it is equivalent, on account of the spiral nature of its scale, to a straight rule 500 in. long.

Sliding Scale. Arrangement by which a scale of variations of one quantity is linked with and made dependent on the variations in another set of quantities. A famous sliding scale was that of the import duties on wheat introduced in 1828. These duties were linked with the home price of wheat; when that was 50s. a quarter, the duty on imported wheat was 36s. 8d.; at 52s., the duty was 34s. 8d.; and so on, until when the home price was 73s. a quarter, the duty was only a shilling.

For many years rates of wages in the British iron and steel industry have been increased and diminished according to changes in the selling prices of the basic iron and steel products.



—(reproduced by courtesy of Dargue Bros., Ltd., Halifax) log-log scales (LU and LL) are also shown on top and lower edges respectively. Scales A, B, C, and D are, in effect, tables of logarithms plotted out to scale on the rule. A and B are alike. Besides the simpler multiplication and division and other mathematical problems solved by the slide rule, squares, square roots, cubes, and cube roots can also be determined

During the First Great War most trade unions negotiated agreements with employers by which wages were to be augmented by a cost-of-living bonus, the amount of which changed a stated amount for every 5 or 10 p.c. alteration in the cost-of-living index. In the Second Great War it again became a practice to tie rates of remuneration to the official cost-of-living figure.

Sliding scales underlie much current economic planning, *e.g.* import quotas, licensing, the payment of subsidies under Agricultural Marketing Acts, and grants-in-aid to local authorities. See Cost of Living.

Slieve Bloom. Mt. range of Eire. Trending S.W. to N.E., it forms part of the boundary between Offaly and Laoighis, and attains an alt. of 1,733 ft.

Slieve Donard. Mountain of N. Ireland, in the S. of Co. Down. It is the loftiest summit of the Mourne Mts., and is 2,796 ft. high.

Sligo. Co. of Connacht, Eire. In the N.W. of the country, its land area is 694 sq. m. It has a low coast-line on the Atlantic, broken by Sligo, Killala, and other bays. The surface is fairly hilly. There are mts. in the N.E., and elsewhere are the Ox Mts. and the Curlew Mts. Rivers include the Moy, Easky, Owenmore, and Owenboy, and loughs the Arrow, Gara, and Gill. The principal industries are grazing cattle, fishing, and growing potatoes and oats. Much of Eire's scanty mineral wealth comes from this co.—coal, lead, copper, iron ore. The Eire state rlys. afford transport facilities. Sligo is the co. town; other places are Tobercurry, Ballymote, and Collooney. Inishmurray and other islands belong to the co. Its place-names figure in the poetry of Yeats, long a resident. Three members are sent to the Dáil. Pop. 62,331.

Sligo. Seaport, market town, and co. town of Sligo, Eire. It stands at the mouth of the Garroogue, where it falls into Sligo Bay, 134 m. N.W. of Dublin by rly. One of the principal seaports on the W. coast, Sligo has a good harbour with ample docks, etc. It exports dairy produce. Other industries are concerned with flour mills, sawmills, and fishing. There is a regular steamer service with Liverpool and Glasgow. The chief building is the R.C. cathedral of the diocese of Elphin, built 1870. About 1252 a Dominican abbey was founded; there are extensive

ruins. Market days, Tues. and Sat. Pop. 12,906.

Slim, SIR WILLIAM JOSEPH (b. 1891). British soldier. Born Aug. 6, 1891, he was educated at King Edward's school, Birmingham, and after serving with distinction in the First Great War, joined the Indian army. Instructor at Camberley staff college, 1934-36, he commanded the 10th infantry brigade in the Sudan at the outbreak of the Second Great War, and took part in the Eritrea campaign, being promoted major-general. Service in the Middle East brought the D.S.O., and Slim led the British 14th army in Burma through a brilliantly executed campaign. In 1945 he was appointed c.-in-c. of Allied Land Forces, S.E. Asia, but in 1946 returned to be put at the head of the Imperial Defence College for a year. In 1948 he was chairman of the rly. executive. Knighted 1944, he was A.D.C. to the king 1947. In 1948 he succeeded Montgomery as C.I.G.S., being promoted field-marshal 1949. See Burma Campaign.



Sir William Slim,
British soldier

Slime. Metallurgical term applied to that portion of crushed ore which, owing to its minutely divided state and the presence of colloidal substances, settles very slowly from water. Generally, that portion of ore which passes through a 200-mesh screen with a 0.003-in. aperture is treated as slime.

Sling. Primitive projectile weapon. The sling is a short piece of leather to each end of which cords are attached; a stone is placed in the pocket formed by the leather, and, gripping both cords, the slinger whirls it; when he lets one cord free the stone is shot out by the momentum. It is frequently referred to in Biblical history, and in classical times Balearic Islanders were renowned slingers. See Armour; First Aid.

Slip. Word used in several senses in engineering. In screw motion the difference between the actual forward travel per revolution of a propeller and the distance which it would move if acting on a solid medium is known as the slip. In a driving-wheel or belt-pulley, the loss of drive owing to insufficient adhesion is referred to as slip.

Slipstream. Stream of air produced by an airscrew when driving an aircraft forward. In contrast to the smooth flow of air over the rest of the aircraft, it is eddying and pulsating, and causes noise, vibration, and strain in the materials over which it passes.

Sloan, JOHN TODHUNTER (1874-1933). American jockey. He first visited England towards the end of the racing season of 1897. "Tod" Sloan attracted attention by the peculiar seat he adopted, perched in a crouched fashion on the horse's withers. At Newmarket on Sept. 30, 1898, he rode five consecutive winners; on April 18, 1899, he won on four successive mounts. His career ended in 1900 when he was accused of betting on his own mount. He died at Los Angeles, Dec. 22, 1933.

Sloane, SIR HANS (1660-1753). British physician, naturalist, and collector. Of Scottish descent, he



Hans Sloane

was born at Killyleagh, co. Down, April 16, 1660, and studied in Paris and Montpellier. He was physician to the governor of Jamaica, 1687-89; secretary of the Royal Society, 1693-1712; president, 1727-41; and president of the Royal College of Physicians, 1719-35. Made a baronet, 1716, he became first physician to the king, 1727, and lived until Jan. 11, 1753, being buried in the churchyard of Chelsea old church. After purchasing the manor of Chelsea, 1712, he presented the freehold of the Chelsea Physic Garden to the Society of Apothecaries, 1721, and his collection of natural history specimens, books, MSS., pictures, coins, prints, etc., formed the nucleus of the British Museum (*q.v.*). Sloane Square, Hans Place, etc., are named after him. He compiled a catalogue of Jamaican plants, 1696, and wrote *A Voyage to Jamaica, etc.*, 1707-25. See Chelsea.

Sloane, WILLIAM MILLIGAN (1850-1928). American historian. Born at Richmond, Ohio, Nov. 12, 1850, he was educated at Columbia College, N.Y., afterwards studying in Germany. He was a teacher in Pittsburgh, then acted as secretary to the historian, George Bancroft, U.S. minister in Berlin. In 1876 Sloane returned to America, and

became professor of history at Princeton, where he remained for twenty years, editing for part of the time *The Princeton Review*. In 1896 he was appointed Seth Low professor of history at Columbia. Sloane's most popular work is his *Napoleon Bonaparte*, 1896, enlarged ed. 1911. He wrote also *The French War and the Revolution*, 1893; *Party Government in the U.S.A.*, 1914; and *The Powers and Aims of Western Democracy*, 1918. He died Sept. 12, 1928.

Slocum, HENRY WARNER (1827-94). American soldier. Born at Delphi, New York, Sept. 24, 1827, he was educated at the military academy of West Point. He left the army in 1856, and practised as a lawyer, but rejoined on the outbreak of the Civil War, in the course of which he was present at both battles of Bull Run, Gaines's Mill, Antietam, Chancellorsville, and Gettysburg, and commanded the left wing on Sherman's famous march to the sea. In 1865 he settled in Brooklyn as a practising lawyer, also taking an active part in political and municipal affairs. He died there April 14, 1894.



Sloe. Fruit and leaves of the blackthorn, the British wild plum

Sloe. Name given to the fruit of the blackthorn, or the tree itself. The fruit is about the size of a small damson, and black or very dark purple in colour, with a white bloom. Very sour to the taste, it is of little value commercially, being used only in the making of sloe gin and a few preserves. See Blackthorn.

Sloop (Dutch *sloop*). Fore-and-aft rigged sailing vessel with one mast, a jibstay and a standing bowsprit. In the sailing ship era of the Royal Navy a sloop was a vessel rated between a cutter and a frigate, armed with 18 guns, and commanded by a lieutenant-commander. In the First



Sloth. Two-toed species, *Choloepus*, of the nocturnal animal of the South American forests
W. S. Berridge, F.Z.S.

Great War, the term was revived for a patrol and convoy protection vessel of 1,100 tons armed with four 4-in. guns. The type survived into the Second Great War, but was largely replaced by the frigate.

Sloth. Family of edentate (toothless) mammals, found only in S. America. They include two genera, the three-toed (*Bradypus*) and the two-toed (*Choloepus*) sloths. The body is bulky and heavy, the head comparatively small and rounded, while the limbs end in hook-like feet armed with very long curved claws by which the animal clings back downwards from the boughs of trees. The hair is long and shaggy, brown or greyish in colour, and tinted green on the animal in its natural conditions by an alga lodging and growing upon it. Though

classed with the Edentata, sloths have five pairs of teeth in the upper jaw and four in the lower; and they feed upon leaves, shoots, and fruit. Among the trees they can move with considerable speed; but on the ground they crawl slowly and with some difficulty. They move about at night. See *Megatherium*.

Sloth Bear or **Honey Bear** (*Melursus labiatus*). Bear of the mountainous regions of India and Ceylon. The only

species of the genus *Melursus*, it has a shaggy black coat, and a long muzzle with very mobile lips. Its food is chiefly honey, fruit, and insects. See *Bear*.

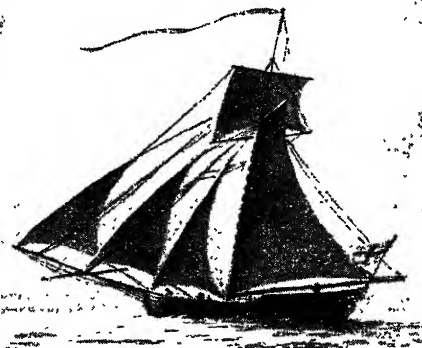


Sloth Bear. Long-snouted, shaggy-haired bear, a native of the mountains of India and Ceylon
W. S. Berridge, F.Z.S.

Slough. Industrial and residential borough of Bucks, England. It lies 20 m. W. of London, and is served by Green Line and three rly. stations, being a junction. The borough charter was granted in 1938, and Slough joins with Eton to elect an M.P. The chief public building is a hall erected to the memory of the duke of Albany. The mechanical transport depot established by the government in the First Great War was transformed into a trading estate of 700 acres accommodating more than 200 factories. Engineering is a principal industry of Slough, where the Herschels carried out much of their astronomical research. Pop. est. 64,911.



Slough arms



Sloop under full sail; a type of vessel used in the navy in the 18th century

From *Falconer's Universal Marine Dictionary*



Slovak. Peasants from the remote districts of the Czechoslovakian republic

Slovak. Slav people in Czechoslovakia. Numbering some 3,000,000, mainly on the N. uplands of the old Hungarian kingdom, they occur also in Moravia, with a sprinkling in adjacent states. They are mostly hard-working peasants, practising a somewhat backward husbandry, or itinerant artisans. Pliant in disposition, they suffered for eight centuries under Magyar oppression, but rapidly adapted themselves to their new freedom after the First Great War. Lutheran or R.C., they have preserved in isolation many primitive Slav customs. Their dialects, like Polish and Czech, pertain to the W. Slavonic languages.

Slovakia. Eastern portion of the republic of Czechoslovakia, which before the First Great War was part of Austria-Hungary. It lies between Moravia on the W. and Ruthenia on the E., Poland on the N. and Hungary on the S. By the constitution of 1948 Slovakia was given an elected national council of 100 members and an executive board of commissioners appointed by the govt. of Czechoslovakia. Bratislava is the capital. Area, 18,902 sq. m. Pop. 3,402,300.

Although the country is chiefly mountainous, it comes down towards the plains of the Morava and Tisza (Theiss) at its W. and E. ends respectively. The Carpathians attain their greatest alt. in the High Tatra, where peaks rise over 8,000 ft. In the upland districts forestry and shepherding are the chief occupations; intensive methods of agriculture have been introduced in the valleys, and there are many industries based on local material, e.g. working flax, wool,

wood, and iron, and making glass. Lignite is found, and water power supplements the relatively scarce coal fuel. Though communications throughout S. Slovakia have been greatly extended, the isolated N. region retains many traditions and customs. See Czechoslovakia.

Slovene. Slav people in Yugoslavia. They number rather over a million, mainly in the old Austro-Hungarian lands of Carniola, Gorizia, Styria, S. Carinthia, and the Istrian coastland. Established there since the 7th century, when the Slav immigration into the Balkan peninsula was pressed back by the Avars, they have in recent times acted as a barrier to the Germanic movement towards the Adriatic. In this service they were effectively aided by their economic and racial organizations, including cooperative societies. Tall, round-headed, they developed in their Alpine habitat sturdy independence. They are intelligent, industrious, businesslike, sociable, and highly musical. Mainly Roman Catholics, they include a small Calvinist section in the N. Their dialects, like Serbian and Croat, pertain to the S. group of Slavonic languages.

Slovenia. Northern portion of Yugoslavia. Almost coterminous with the former Austrian province of Carniola, it was incorporated after the First Great War into the Serb, Croat, and Slovene state known as Yugoslavia. Covering an area of 6,266 sq. m., with a pop. of 1,144,298, it is traversed by several mt. ranges. The principal river is the Save, and there are several important lakes. The chief cities include Ljubljana (Laibach), the capital, and Maribor (Marburg). See Carniola; Yugoslavia.

Slow March. Ceremonial march used in the British fighting services at funerals and trooping of the colour. When slow marching without weapons, both arms are held rigidly to the sides and the party steps off with the left foot, the leg being rigid, and the foot slid along the ground toe downwards to make a pace of 30 ins. The step is then completed with the right foot, there being a distinct pause between each leg movement. When slow marching under arms at funerals, rifles are held reversed under the left arm, the butt towards the front and the muzzle to the rear declined at an angle of 45°.

Slow Match. Simple type of fuse which smoulders very slowly. It is prepared by soaking loose hemp cords in a dilute solution of saltpetre and then drying. When

ignited it burns at the rate of about 3-4 ins. an hour. In olden times it was used in matchlock guns as a means of keeping a light ready for use; and later for military and civil blasting, to provide a delay action in various types of projectiles, and in fireworks.

Slow-worm OR **BLIND-WORM** (*Anguis fragilis*). Limbless lizard. It is common throughout Europe, except in the N., and is of a brownish-grey colour, with a streak of black down the back. It is more usually known by its alternative name of blind-worm (*q.v.*). See Regeneration.

Sloy, Loch. Stretch of water in Dumfriesshire, Scotland, 30 m. N.W. of Glasgow and 3 m. W. of Loch Lomond. As part of the Highland Development Scheme (*q.v.*), it was tapped to supply electric power to part of the Highlands and the Glasgow area. The work, begun in 1945, involved building a dam on Loch Sloy to form a reservoir of 1,200 million galls. capacity, tunnelling 1½ m. through Ben Vorlich, and erecting a power station supplying 130,000 kW. on the banks of Loch Lomond.

Slubice. Polish name for Frankfurt-on-Oder (*q.v.*), in Polish occupation after the Second Great War.

Slug. Name given to those land molluscs in which the shell is either internal or absent. In other



Slug. The black slug, *Arion ater*, with tentacles partly retracted. Reduced

respects they do not differ in any essential features of structure from snails. The British Isles have 20 species of slugs, including three of *Testacella*, in which there is a small external shell on the hinder end of the foot. All British slugs have small flattened shells concealed within the mantle cavity, but in one group the shell is reduced to a mere chalky granule, not always to be found in dissection.

Most of the destruction in gardens commonly ascribed to snails is the work of slugs, especially of the field slug (*Agriolimax agrestis*) and the keeled slug (*Limax Sowerbyi*), both of which are abundant. Most other slugs feed upon fungi, lichens, and decaying animal and vegetable matter, and are harmless to garden plants. Slugs are hermaphrodites and deposit their eggs in holes in the ground. In winter they hibernate under stones and often



Slug. The species *Limax rufus*

at some distance under ground. They hide during the day and feed at night. They may be caught in large numbers by placing scalded bran under pieces of tile or slate in the evening. *See* Mollusca; Snail.

Sluice Gate. Solid gate used to control the flow of water in a channel or weir. Made of wood or steel, and usually rectangular, the gate moves vertically in guides and is raised or lowered by hand or machine. If the water level on the discharge side is above the highest point of the sluice, a submerged gate is used. Sluice gates are employed principally for filling irrigation channels, controlling flow into reservoirs, and in some sewage disposal schemes.

Slum. Word meaning a poor street or neighbourhood. It is therefore used for a district where houses are crowded together and are dilapidated and insanitary. The haphazard growth of large towns during the 19th century led to a large increase in the size and number of slum areas in Great Britain, and towards the end of that century much philanthropic effort was being expended towards the alleviation of slum life. The 20th century saw the adoption of a more practical policy, local authorities being more concerned with slum clearance by resettlement of the slum-dwellers either on housing estates amid better conditions elsewhere or in new houses or blocks of flats built on the site of the cleared slums. It is to be noted that even good districts with well-built houses may degenerate into approximate slum conditions by overcrowding or by the uncleanly habits of those who occupy them. *See* Housing; Public Health; Town Planning.

Slur. In music, a curved line, the meaning of which varies according to circumstances. (1) It is often synonymous with Legato (*q.v.*). (2) It indicates the extent of the phrase. (3) As a mark of phrasing, it is properly applied over two notes only, the second of which does not exceed the first in value. In performance, the first note receives special stress, and is closely united to the second note,

which is slightly weakened as well as shortened. (4) In vocal music, it is placed over two or more notes which are to be sung in a single syllable. When used otherwise, it may imply the vocal grace of *Portamento*. (5) If used in combination with dots, it means that the break between the notes should be very slight.

Slutsk. Town of White Russia S.S.R. It is 60 m. S. of Minsk, on the Sluch, a tributary of the Pripiet. A communications centre, captured by the Germans in early July, 1941, it was liberated June 30, 1944. Pop. est. 16,000.

Sluys, BATTLE OF. Naval engagement fought between the English and the French, June 24, 1340. Edward III had declared himself king of France in Jan., 1340, besides being "lord of the sea and of the passage across the sea." Yet the French had ravaged Sandwich, Winchelsea, Rye, Hastings, Southampton, and Portsmouth, and had captured numerous English vessels. Accordingly a fleet comprising about 200 ships was assembled in the Orwell, and on June 20, 1340, Edward embarked in the "cog" Thomas, and the whole armament set sail, being joined off Blankenberghe by the northern fleet of 50 sail. Edward put the strength of the enemy at 190 ships. They had with them a Genoese contingent under Barbanegra.

They lay at anchor in the river Sluys, some 10 m. from Blankenberghe, well armed with knights, men-at-arms, crossbowmen, and stone-throwers. Edward carried his fleet into the river on the flood tide, on the morning of June 24. There was a fatal defect in the French defence, because the English blow struck the end of the line, and ship after ship was carried with terrific slaughter. It is possible that the French ships, or some of them, had got under way before the impact. The tide turned, and Barbanegra's ships slipped their cables and escaped. Of the fleet only 24 got away, and of these several were afterwards taken at sea. *Pron.* Slois.

Sly, CHRISTOPHER. Character in Shakespeare's *Taming of the Shrew*. In the Induction to the play, Christopher Sly, a drunken tinker, is found by a lord who, in jest, takes him home and has him placed in the best chamber of his mansion. When Sly awakes he is treated with every respect, and made to think he is a lord indeed. For his diversion the play of *The Taming of the Shrew* is performed.

Smack (Dutch, *smak*). Name given to fishing vessels that sail, but strictly a decked or half-decked boat used for trawling. *See* Boat.

Smailholm. Parish of N. Roxburghshire, Scotland. On Eden Water, on the Berwickshire border, $5\frac{1}{2}$ m. N. of Kelso, its ivy-clad church is said to date from the middle of the 17th century. Smailholm Tower, about 7 m. E. of Melrose, has been identified as the Avenel Castle of Scott's novel *The Monastery*. A square gabled building with courtyard, it dates from the 15th century. Sandyknowe Crags, $1\frac{1}{2}$ m. to the S.W., is associated with Scott's early life.

Small Arms. General classification which includes those weapons, whether designed for thrusting, stabbing, cutting, or the discharge of missiles, which can be conveniently operated and transported by one man. *See* Ammunition; Bayonet; Revolver; Rifle, etc.; also Musketry, School of.

Small Heath. Suburb and bor. constituency of Birmingham (*q.v.*).

Small Holdings. Portions of land of limited area or rental let to agricultural workers for their own cultivation. In Great Britain the progress of enclosures, and the general tendency of agricultural development towards large-scale farming, gradually caused the disappearance of the small holders or owners of land. By the middle of the 19th century this class only survived in a few isolated districts, *e.g.* the New Forest and the Isle of Axholme, Lincolnshire. A Small Holdings Act of 1897 had assigned to every dwelling built for "persons engaged in husbandry" an area of at least four acres of land, but this was abolished in 1975.

The subsequent rural depopulation and growing discontent among agricultural labourers led to various pieces of small-holding legislation. In 1892 the Small Holdings Act was passed; it was designed to help agricultural labourers to acquire a holding by a system of instalment purchase, and fixed the limits of such holdings, which were to be allotted by county councils, as from one to 50 acres, or up to £50 annual rental. The Act was a failure, however, and was superseded. The Small Holdings Allotments Acts, 1908-31, gave power to local authorities to acquire land for these purposes. The powers may be exercised compulsorily with the consent of the ministry of Agriculture. *See* Agriculture; Allotment; Enclosures; Land Settlement.

Small-pox OR **VARIOLA**. Acute infectious disease, caused by a virus which gains a footing through the respiratory tract. The disease is very contagious, and the infection is conveyed by small scales, which are shed like a dust from the skin at the peak of the eruption and during convalescence. The patient is not free of power to convey the disease until the skin is perfectly clear from eruption and the consequent scaling. The incubation period is from 10 to 14 days. Persons of any age may be attacked, the mortality rate being 25 to 50 p.c. Epidemics vary much in virulence. Native races are much more susceptible to the disease, and show a higher mortality from it, than Europeans.

Several forms of small-pox are recognized. In the ordinary form the symptoms begin with a chill, and a rise of temp. to 103° or 104° F. In children there may be convulsions. Severe headache, pains in the back, and vomiting occur, and sometimes delirium. In some cases, within the first three days an initial rash, which may resemble that of scarlet fever or measles, appears. Usually on the fourth day papules appear on the forehead, face, and scalp, and extend over the whole body. These pass through a series of changes and suppurate about the ninth day. They begin to dry up about the eleventh day, and later scars are formed, producing pitting.

Haemorrhagic small-pox or black small-pox is a form in which haemorrhage occurs into the pustules, and there may be haemorrhage from the mucous membranes. In one form of haemorrhagic small-pox the bleeding occurs early, and death may follow in a few days. In another form, the disease progresses as in the ordinary type, and then in the pustular stage haemorrhages occur. Varioloid is a modified form of small-pox which occurs in people who have been vaccinated, and is milder.

Segregation of the patients in special institutions is essential. No drug has any specific influence on the disease, but a good deal can be done to relieve the symptoms and lessen the risk of disfigurement from pitting of the skin. Signs and symptoms are dealt with as they arise. The diagnosis, as between chicken-pox and small-pox often presents difficulty; but the history of vaccination, the distribution and size of the pustules, and the severity of the prostration decide the question. Small-pox is a notifiable disease. See Vaccination.

Smalt. Blue pigment, mainly cobalt silicate. It dates from the 16th cent., when it replaced the older Egyptian blue, a complex copper silicate. Smalt is made by roasting cobalt-glance or other suitable cobalt ore, and then fusing it with a mixture of quartz-sand and potash. This forms a cobalt glass, which is poured into cold water and then ground to a fine powder. Smalt was formerly used for tinting starch and paper and in artists' colours; it is still used in china and glass painting. See Cobalt; Pigment.

Smaltite. In mineralogy, cobalt arsenide, CoAs_2 . It usually contains nickel arsenide, passing to chloanthite, NiAs_2 . Smaltite is an important source of cobalt, usually occurring in vein deposits of silver, nickel, and copper, the cobalt being extracted as a by-product. See Cobalt.

Smart, CHRISTOPHER (1722-71). British poet. Born at Shipbourne, near Tonbridge, Kent, April 11, 1722, he was educated at Pembroke College, Cambridge, of which he became a fellow in 1745. He early established a reputation as a facile versifier, but through intemperance and improvidence sank into the position of a bookseller's hack in London. After being twice in a madhouse, he died in London in a debtors' prison, May 21, 1771. Smart's translations from the classics have been superseded, his epigrams and satires forgotten, but he lives by his Song to David, a poem of real power, which won the enthusiastic praise of D. G. Rossetti. Consult The Song to David, with Intro. by R. A. Streatfeild, 1901; English Poets, T. H. Ward, 1904.

Smart, SIR GEORGE THOMAS (1776-1867). British musician. Born in London, May 10, 1776, he became a member of the Chapel Royal choir, and in 1791 a church organist in Hampstead Road. He played in various orchestras, and in 1811 conducted a successful series of concerts in Dublin, where he was knighted by the lord-



Sir George Smart,
British musician



Christopher Smart,
British poet

lieutenant. An original member of the Philharmonic Society, he conducted many of its concerts, 1813-44, and also musical festivals all over the country. He also taught, Jenny Lind being among his pupils. He died Feb. 23, 1867.

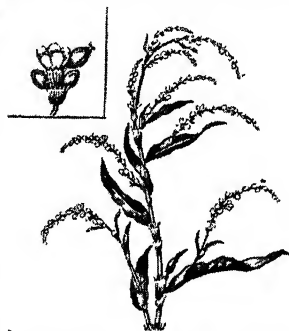
Smart, HENRY THOMAS (1813-79). British composer and organist. Nephew of Sir G. T. Smart, he



H. T. Smart,
British composer

was born in London, Oct. 26, 1813, and studied for the army and the law before turning finally to music, and was organist at Blackburn, Lancashire, 1831-36. From that year he was organist to several London churches, and had a high reputation, but his failing sight from 1864 hampered his later years, and he died in London, July 6, 1879. His compositions include an opera, Bertha, or the Gnome of the Hartzberg, 1855; the cantatas, King René's Daughter, 1871, and Jacob, 1873; much sacred music, part-songs, and organ music.

Smartweed OR **WATER PEPPER** (*Polygonum hydropiper*). Annual herb of the natural order Poly-



Smartweed. Leaves and flower
sprays of the Water Pepper. Inset,
single flower

gonaceae. A native of the N. temperate hemisphere, it has a creeping, much-branched stem with swollen joints and lance-shaped leaves. The small greenish-rosy flowers are in short terminal sprays. The juices are very acrid, from which it has received its popular name, and it has been used for medicinal purposes as a diuretic.

Smeaton, JOHN (1724-92). British engineer. Born at Austhorpe, near Leeds, England, June 8, 1724, he early showed remarkable mechanical ability. Though edu-

cated for the bar he turned his attention to the manufacture of scientific instruments and wrote many engineering papers for the Royal Society, the gold medal of which he received in 1759 for his paper on wind and water mills. He made a special study of canal and harbour construction, and in 1755 he was called upon to replace the second Eddystone lighthouse, a work he completed in 1759. He built a number of bridges, including those at Perth, Banff, and Coldstream, and constructed the Forth and Clyde canal. In 1771 he founded the club which became the Institution of Civil Engineers. He died Oct. 28, 1792. *Consult* Lives of the Engineers, S. Smiles, 1861.



John Smeaton,
British engineer
After Mortimer

Smedley, FRANCIS EDWARD (1818-64). British novelist. Born at Great Marlow, Buckinghamshire, Oct. 4, 1818, Smedley received a private education. His novels include Frank Fairleigh, 1850, his best book, notable for its telling pictures of education under a private tutor; Lewis Arundel,



Francis Smedley,
British novelist

1852; and Harry Coverdale's Courtship, 1854. He edited Sharpe's Magazine for a time, and also the short-lived George Cruikshank's Magazine. Smedley died May 1, 1864.

Smell. Sense common to many animals. The word is also frequently used, not strictly correctly, for that which excites the sense of smell. The organs of smell consist of the olfactory region in the nose, which is a part of the mucous membrane covering the upper turbinal bone and the adjacent part of the nasal septum, and containing special olfactory nerve cells. The olfactory nerves pass up through minute holes in the cribriform plate of the ethmoid bone, and enter a complicated structure, the olfactory bulb, which is a continuation of the olfactory tract in the brain. Certain animals, e.g. the porpoise, appear to have no sense of smell. In others, the sense of smell is much more acute than in the human species. Even in man,

however, it has been calculated that a three hundred-millionth part of a grain of musk is distinctly appreciable. *See* Nose.

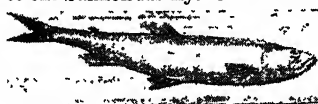
Smellie, WILLIAM (1740-95). Scottish printer and scientist. Born in Edinburgh, he served an apprenticeship with a printing firm, 1752-59, attending also classes at Edinburgh university, winning a gold medal for an able botanical essay in 1765. In that year he started a printing business on his own account, gained an important university connexion, and printed the first edition, in three volumes, of The Encyclopaedia Britannica, 1771. An active student of natural history, Smellie published his successful Philosophy of Natural History, 1790-99, and a translation of Buffon's Natural History, 1781. He was an original member of the Society of Antiquaries of Scotland, becoming secretary in 1793, and was a well-known figure in the intellectual Edinburgh society of his day. He died June 24, 1795.



W. Smellie, Scottish
printer and scientist

Smelling Salts. Preparation of ammonium carbonate and a perfume. It is used as a stimulant, as a restorative in faintness, and to give relief in nasal catarrh.

Smelt (*Osmerus*). Genus of small marine fishes closely related to the Salmon family. Of the three



Smelt. Small fish that inhabits the waters round the British coasts

W. S. Berridge, F.Z.S.

species, the common smelt (*O. eperlanus*) is the only one occurring in European waters; and it is numerous about the British coasts. It is fond of brackish waters, and is often found in the Thames above London. It grows to a length of seven or eight inches, though it is usually less, and has a silvery grey hue, with greenish back.

Smelting. In metallurgy, those operations in which the ores of metals are melted or fused. Hence the process of smelting is necessarily carried out in some form of furnace, and calls for some form of fuel or source of heat, while in many cases it requires fluxes. *See* Furnace; Metallurgy, and the articles on the various metals

Smerwick. Bay of co. Kerry, Eire. An opening of Dingle Bay, it is 5 m. from Dingle. At the harbour here 600 Spanish and Italian soldiers landed in July, 1579, to help the Irish against the English. They entrenched themselves in two forts and held out until Nov., 1580, when the English leaders, now in a position to act on the offensive, forced them to surrender. As Philip II of Spain had not formally sanctioned the expedition, the troops were put to death as pirates by the troops under Lord Grey de Wilton and Sir Walter Raleigh.

Smetana, BEDRICH (1824-84). Czech composer. Born at Litomysl, Bohemia, March 2, 1824, the boy

who was to be acclaimed as the founder of a national school of music, was a prodigy at the piano. After teaching music in Prague, he went to Gothenburg, 1856-61, to conduct for its philharmonic society. Then he helped to start what became the Czech philharmonic society, and conducted at the Prague opera house from 1866 until deafness overtook him in 1874. On May 12, 1884, he died in a mental home. This intensely nationalist composer is chiefly known by his second opera, The Bartered Bride, first performed 1870. Other operas, Dalibor, and Libusa, are based on Czech legends. Of the six symphonic poems Ma Vlast (My Country), the most often heard is Vltava, which, brilliantly scored, depicts the river of Prague. He also composed piano music, including polkas, Czech dances and other national pieces; some songs and choral music; and two string quartets and a pianoforte trio.



B. Smetana,
Czech composer

Smethwick. County and mun. borough of Staffordshire, England. It is 3½ m. from Birmingham and is



Smethwick arms

served by rly. The industries include engineering works and the making of glass, chemicals, and hardware. The chief buildings are those used for municipal purposes and several modern churches. There are 10 parks and recreation grounds. A village until the 18th century, Smethwick was made a borough in 1899 and a county

borough in 1907. From 1918 Smethwick has elected one member to parliament. Pop. 76,700.

Smew, *SMEW*, OR *NUN* (*Mergellus albellus*). British sea duck, belonging to the same group as the merganser. The plumage of the male is black and white, and the female is distinguished by a reddish-brown head. It occurs occasionally in winter on the E. coasts. See Merganser.

Smigly-Rydz, **EDWARD** (b. 1886). Polish soldier. He fought with Pilsudski's legions in the First Great War and was created c.-in-c. of the Polish military organization in 1918. An inspector of the army from 1922, he became inspector-general in 1935 and a marshal of Poland next year. When Germany invaded Poland, Sept. 1, 1939, Smigly-Rydz took command of the army, but on its defeat went to Rumania. He was arrested in Oct., 1940, but escaped.

Smike. Character in Dickens's *Nicholas Nickleby*. The drudge at Wackford Squeers's school, Dotheboys Hall, and half-witted through brutal treatment, he develops a dog-like devotion to Nicholas Nickleby, and follows him on his adventures, playing small parts in Mr. Crummles' theatrical troop to which Nicholas belongs. He dies as a result of his former ill-usage, and it is then discovered that he is the son of Ralph Nickleby, and Nicholas's cousin.

Smilax. Genus of shrubby plants belonging to the order Liliaceae. See China-root.

Smiles, **SAMUEL** (1812-1904). British author and social reformer. Born at Haddington, Dec. 23, 1812,



Samuel Smiles,
British author

he was intended for the medical profession, and graduated M.D. at Edinburgh university. Dissatisfied, however, with medical practice, he went to Leeds, where he became editor of *The Leeds Times*, and an active social reformer. Subsequently he became identified with railway management in Leeds, and later in London. His first considerable literary success was his biography of George Stephenson, 1857. In 1859 appeared the book on which his fame mainly rests, *Self Help*, a work designed to show what can be accomplished in life by determination and the will to succeed, and illustrated by copious

examples from the lives of eminent men. The book achieved amazing popularity all over the world. Very popular also were *Character*, 1871; *Thrift*, 1875; and *Duty*, 1880. Other works are *Lives of the Engineers*, 1861; *Industrial Biography*, 1863; *James Nasmyth*, 1883; and *Josiah Wedgwood*, 1894. Smiles died in London, April 16, 1904. Consult *Autobiography*, ed. T. Mackay, 1905.

Smillie, **ROBERT** (1857-1940). British labour leader. Born in Belfast, March 17, 1857, of Scottish

parents, he was early taken to Scotland, where he started work in a factory at the age of 11. Later he worked in a Clyde shipyard, then became a miner in Lanarkshire. He was president of the Scottish miners' federation, 1894-1918, and again from 1921 until his death. As president of the Miners' Federation of Great Britain, an office he held 1912-21, he led the strike of coal miners in 1912 which brought about a national minimum wage. He was a member of the royal commission on mines, 1919, presided over by Sir John Sankey (see Sankey, Viscount), and in 1928 a member of the general council of the T.U.C. He was Labour M.P. for Morpeth 1923-29. His autobiography, *My Life for Labour*, was published 1924. He died Jan. 16, 1940.

Smilodon OR **MACHAERODUS NEOGAEBUS**. Largest of the long-tusked extinct cats, also known as sabre-toothed tigers. The smilodon was the size of a modern tiger, and its tusks projected some seven inches from its jaw. See *Machaerodus*.

Smirke, **SIR ROBERT** (1781-1867). British architect. Born in London, Oct. 1, 1781, he studied at the



Sir Robert Smirke,
British architect

R. A. schools, and was articled to Soane. After travelling in Italy and Greece, he was appointed architect to the board of trade. He was elected A.R.A. in 1808, R.A. in 1811, and was treasurer of the academy 1820-50. In 1859 he removed from London to

Cheltenham, where he died, April 18, 1867. His best-known work is the British Museum, completed 1847; he also designed the old general post office, demolished 1913, and the Royal College of Physicians in Pall Mall East. Smirke's style for the most part was classic and massive.

Smith, **ADAM** (1723-90). British economist. The posthumous son of an official in the customs, he was born at Kirkcaldy, June 5, 1723, and was there educated.



Adam Smith,
British economist

From the university of Glasgow he went in 1740 to Balliol College, Oxford. In 1748 Smith began to lecture in Edinburgh, and in 1751 was chosen professor of logic at Glasgow, where during 1752-63 he was professor of moral philosophy. In 1764 he went abroad with a pupil, the duke of Buccleuch, after which he gave ten years mainly to writing and study. In 1776 the result of this labour appeared in *The Wealth of Nations*. Two years later he was appointed a commissioner of customs, a post he held until his death, July 17, 1790.

Smith enunciated a philosophy of his own, that all our sentiments arise from sympathy, in his *Theory of Moral Sentiments*, 1759. His reputation, however, rests on his *Wealth of Nations*, the most influential and exhaustive work of his kind. Its influence on the study of political economy was enormous, and it was perhaps equally great on practical politics. The book was widely translated, and studied all over the world. Mention should be made of Smith's friendships with Hume and many notable literary figures of his day, in France as well as in Great Britain. See *Political Economy*; *Wealth of Nations*.

Bibliography. Lives, R. B. Hal-dane, 1887; J. Rae, 1895; *The House of Adam Smith*, E. Ginzberg, 1934; A. S. as Student and Professor, W. R. Scott, 1937.

Smith, **ALEXANDER** (1830-67). Scottish poet. Born at Kilmarnock, Dec. 31, 1830, he became a pattern designer in Glasgow, but early began to write verses. His first considerable work was *Life Drama*, 1853. In 1859 he was appointed secretary to Edinburgh university. He died at Wardie, Midlothian, Jan. 5, 1867. His



Alexander Smith,
Scottish poet

Household, 1866. Smith, Dobell, and Bailey were classed together by Aytoun as the Spasmodic School of poetry.

Smith, ALFRED EMANUEL (1873-1944). American politician. Born of poor parents on the east side of New York, Dec. 30, 1873, he worked as a clerk. In 1903 he was elected to the N.Y. assembly as a Democrat, and became majority leader of the party in 1911. In 1915 he was New York sheriff, and in 1918 governor, being re-elected 1922, 1924, and 1926. He fought corruption, introduced much reforming legislation, and was a keen opponent of prohibition. Humour and honesty made "Al" Smith, a Roman Catholic, widely popular. In 1928 he was Democratic candidate for the presidency, but was defeated by Hoover. He died Oct. 4, 1944. See Roosevelt, F. D. Consult also Life, J. Costello, 1928.

Smith, SIR BEN (b. 1879). British politician. A London taxi-driver, he became an organizer of the Transport and General Workers' Union. Alderman for Bermondsey council, he sat as Labour M.P. for Rotherhithe, 1923-31 and 1935-46. He was parl. secretary to the ministry of Aircraft Production, 1942, then a successful minister resident in Washington for supply, 1943-45. Knighted in 1945, he was given the food ministry in C. R. Attlee's govt., but resigned in 1946, becoming chairman of the W. Midlands divisional coal board until 1950.

Smith, SIR CHARLES AUBREY (1863-1948). British actor. Born July 21, 1863, and educated at Charterhouse and Cambridge, he captained Sussex at cricket and led teams to Australia and S. Africa. Although intended for a medical career, he decided to go on the stage instead, making his first appearance in 1892. After



Sir C. Aubrey Smith,
British actor

works include Sonnets on the War, 1855, written in conjunction with Dobell; City Poems, 1857; the epic Edwin of Deira, 1861; and a novel, Alfred Hagart's

1930 he was in films, mainly in America, where he tried to popularise cricket. His usual rôle was that of the English soldier or country gentleman, and he was seen in Lives of a Bengal Lancer, 1935; Little Lord Fauntleroy, 1936; Rebecca, 1940; The White Cliffs of Dover, 1944; and the British film An Ideal Husband, 1948. Knighted 1944, he died at Beverly Hills, Calif., Dec. 20, 1948, his ashes being brought to England for burial at Hove.

Smith, DODIE. Contemporary British playwright. Born at Whitefield, Lancs, she was educated in Manchester and at St. Paul's school, London. After studying at the R.A.D.A. she made her stage début in musical comedy in 1915. Later she joined a London firm as a buyer of pictures. Her first play given professionally, Autumn Crocus, was an immediate success at the Lyric Theatre, 1931; as were Service, 1932; Touch Wood, 1934; Call It a Day, 1935; Bonnet over the Windmill, 1935; and Dear Octopus, 1938. In 1949 she pub. a novel, I Capture the Castle. Until 1935 she wrote as C. L. Anthony.

Smith, EDWARD PERCY (b. 1891). English playwright and politician. Born Jan. 5, 1891, he was educated at Haileybury and in France, and served as a seaman in the R.N.V.R., 1915-17. Under the name Edward Percy he wrote plays outstanding for suspense and powerful plots: If Four Walls Told, 1922; The Rigordans, 1926; The Shop at Sly Corner, 1945; also, with Reginald Denham, Suspect, 1937; Ladies in Retirement, 1939. A director of several milling companies, he was M.P. for Ashford, Kent, 1943-50.

Smith, LADY ELEANOR (1902-45). English novelist. Born in Birkenhead, this elder daughter of the first Lord Birkenhead started her career at 17 as society reporter for The Sphere and The By-stander, but gave up journalism to write novels. She was fascinated by gypsy life from an early age, and her first book, The Red Wagon, 1930, was about gypsies and circuses. To write more realistically she travelled with a circus (on one tour with Laura Knight), and even rode in the ring.



Lady Eleanor Smith,
English novelist

Flamenco, 1931; Tzigane, 1935; and Caravan, 1943, were all romantic stories. Ballerina, 1932, was based on the life of Pavlova; The Man in Grey, 1941, was a Regency romance; and Life's a Circus, 1939, was autobiographical. She died Oct. 20, 1945.

Smith, GEORGE (1840-76). British Assyriologist. Born in London, March 26, 1840, he practised engraving.



George Smith,
British Assyriologist

Some cuneiform plates entrusted to him led him to study the British Museum inscriptions. Observed by Rawlinson, he became museum assistant, 1867; collaborated in his Cuneiform Inscriptions of Western Asia; deciphered the Cypriote script; and wrote a History of Assyrian Discoveries, 1875, and The Chaldean Account of Genesis, 1876. While taking part in another expedition, he died at Aleppo, Aug. 19, 1876.

Smith, SIR GEORGE ADAM (1856-1942). British scholar and divine. Born at Calcutta, Oct. 19, 1856, he was educated at Edinburgh, Tübingen, and Leipzig. After a period of travel and study in Egypt and Assyria, he entered the ministry of the Free Church of Scotland and became assistant minister at Brechin in 1880. He was Hebrew tutor at the Free Church College, Aberdeen, and in 1882 was chosen to be minister of Queen's Cross church in that city.

In 1892 Smith was appointed professor of O.T. language, literature, and theology at the Free (later U.F.) Church College, Glasgow, a position he retained until 1909, when he became principal of Aberdeen university until 1935. He was moderator of the general assembly of the U.F.C., 1916-17, and chaplain to the king in Scotland from 1933 until his death, March 3, 1942. Standard



books by Smith, who was knighted in 1916, are *Historical Geography of the Holy Land*; *Life of Henry Drummond*; *The Book of Isaiah*; *The Twelve Prophets*.

Smith, GEORGE MURRAY (1824-1901). British publisher. He was born in London, March 19, 1824. His father, George Smith (1789-1846), with a fellow Scot, founded in 1816 the London stationers and booksellers, Smith and Elder, first in Fenchurch Street, then in Cornhill. George Smith the younger joined his father in 1838 and became head of the business of Smith, Elder, and co. in 1846, and founded *The Cornhill Magazine*, 1859, and *The Pall Mall Gazette*, 1865.

In 1869 the publishing was removed to Waterloo Place, Pall Mall, where, 1885-1901, under the editorship of Leslie Stephen and Sidney Lee, *The Dictionary of National Biography* was issued. Smith died on April 6, 1901; the business was then carried on by his sons and son-in-law, after whose death it was taken over by the firm of John Murray, the D.N.B., however, passing to the Oxford University Press (*q.v.*). Consult *Memoir*, Sir Sidney Lee, D.N.B., vol. xxii; *Life and Letters of Leslie Stephen*, F. Maitland, 1906.

Smith, GOLDWIN (1823-1910). British publicist and historian. Born at Reading, Aug. 13, 1823, he was educated at Eton and Magdalen College, Oxford. He won several university prizes and became a fellow of University College in 1847, and, though called to the



Goldwin Smith,
British publicist

bar in the same year, never practised. He was closely identified with the reform of university education at Oxford, and became regius professor of history there in 1858. Resigning in 1866, in 1868 he was appointed professor of English and constitutional history at Cornell, U.S.A., and in 1871 he settled in Toronto, where, at The Grange, he lived for the rest of his life, marrying a wealthy Canadian.

A sincere, if somewhat vehement reformer, Smith all his life was

engaged in combating clericalism, militarism, and imperialism. His views were set forth in trenchant style in articles he contributed to the press. In Canada he advocated in the first instance independence from the mother country and subsequently amalgamation with the U.S.A. His best known works include *Three English Statesmen*, 1867; *Canada and the Canadian Question*, 1891; and *Questions of the Day*, 1894. Goldwin Smith died June 7, 1910.

Smith, HENRY JOHN STEPHEN (1826-83). British mathematician. Born in Dublin, Nov. 2, 1826, he was educated privately and at Balliol College, Oxford, of which he became a fellow and mathematical lecturer. Appointed Savilian professor of geometry at Oxford, 1860, he died Feb. 9, 1883. Smith did his best work in connexion with the theory of numbers, a report of which in six parts he presented to the British Association. Consult *Collected Mathematical Papers*, 2 vols., 1894.

Smith, HERBERT (1862-1938). British labour leader. Born in a Yorkshire workhouse, the son of a miner killed before he was born, he began work in the mines when he was ten years old. While still a young man he was chosen as checkweighman, and became vice-president of the Yorkshire miners' association about 1904. Two years later he became president of the association, an office he held for more than 25 years. He was president of the Miners' Federation of Great Britain, 1922-29, in succession to Robert Smillie. Together with A. Cook he led the miners in the coal dispute which led to the General Strike (*q.v.*) of 1926. Though the miners were defeated, their loyalty to and trust in Smith never wavered. In addition to his work as a trade union leader, he took a large part in local govt., first as a member of the Barnsley school board, then as member of the bor. council, alderman, mayor, member of the West Riding county council, and magistrate. He died at Barnsley, June 16, 1938.

Smith, HORATIO OR HORACE (1779-1849). British wit. Born in London, Dec. 31, 1779, he was educated at Chigwell, Essex, and began life in a counting-house in London, but early turned to litera-

ture. After writing three novels and contributing to periodicals, he suddenly, with his brother James (*v.i.*), became famous by their volume, *Rejected Addresses*, in 1812. The occasion was the competition for a prize offered by the managers of Drury Lane Theatre for a poem to be recited at the re-opening of the theatre, which had been rebuilt after the fire of 1809. The brothers very wittily parodied the leading poets of the day, among Horace's best efforts being his imitations of Scott and Byron. Having become wealthy as a stockbroker, he retired in 1820, and died July 12, 1849. Of his novels the historical romance, *Brambletye House, or Cavaliers and Roundheads*, 1826, is the best known, and of his verse, apart from his contributions to *Rejected Addresses*, *An Address to a Mummy* is best remembered.



Horace and James Smith, British
wits and parodists



Smith, JAMES (1775-1839). British wit. Elder brother of Horace Smith, he was born in London, Feb. 10, 1775, was educated at Chigwell, and became solicitor to the board of ordnance, 1812. He joined his brother in the composition of *Rejected Addresses* in 1812, contributing among others the parodies of Wordsworth, Southey, Cobbett, and Crabbe. He also published the volume of verse, *Horace in London*, 1813, and acquired a reputation as a wit. He died in London, Dec. 24, 1839.

Smith, SIR JAMES EDWARD (1759-1828). British botanist. Born at Norwich, Dec. 2, 1759,



Sir James Smith,
British botanist

and educated at Edinburgh university for a medical career, he studied botany under John Hope. He was elected F.R.S. in 1785. In 1788 he founded the Linnean Society on the model of the Royal Society, and became its first president, an office he held until his death, March 17, 1828. Smith's chief publication was the letterpress to what is known as Sowerby's *English Botany*. He published also a *Flora Britannica*, 1800.

Smith, JOHN (1580-1631). English soldier and colonist. Born at



John Smith,
English colonist

Willoughby, Lincolnshire, he went abroad as a young man, saw service in France and Flanders, and, after many wild adventures, entered the Austrian army, fighting the Turks, being taken captive to Constantinople, and escaping thence to England, 1605. The following year he joined an emigrant party to Virginia, arriving at Chesapeake Bay, April 26, 1607. There he proved an able member of the council and a successful captain against the natives. In a fray with the Indians, Smith was captured, but released, according to his own account, at the intercession of Princess Pocahontas (q.v.). In 1608 Smith became president of Virginia. He explored and mapped Chesapeake Bay. Owing to dissensions in the colony, Smith returned to England, but in 1614 crossed to New England and charted the coast as far as Cape Cod. After a further voyage in 1617, he retired from active work, dying in London. He wrote many books and pamphlets (rep. Arber, 1884) relating his own adventures and describing the colony in Virginia. *Consult* Lives, C. D. Warner, 1881; A. G. Bradley, 1905; E. K. Challerton, 1934.

Smith, JOHN RAPHAEL (1752-1812). British mezzotint engraver. Born at Derby, he was brought up to the drapery trade, but in 1769 adopted the engraver's profession. He was closely associated with George Morland, and engraved hundreds of plates after Reynolds, Gainsborough, etc. He died March 2, 1812.

Smith, JOSEPH (1805-44). Founder of Mormonism. Born at Sharon, Vermont, U.S.A., Dec. 23, 1805, he began to announce his visions at the age of 15, and in 1827 alleged that under angelic guidance he had discovered new scriptures, which he professed to translate, and published, 1830, as the Book of Mormon. The church was organized the same year, with Smith as president, and the remainder



Joseph Smith,
Founder of Mormonism, in military uniform

of his history is that of the Mormon church. He governed his followers by a series of "revelations," the last, July 12, 1843, enjoining the practice of polygamy. This doctrine was not published to the world, but it was obeyed by Smith and other leading members of the community. So bitter was the hostility aroused among non-Mormons that Smith and his brother were assassinated near Nauvoo, Ill., when the Mormons were driven from the state, June 27, 1844. *See* Mormons.

Smith, LOGAN PEARSELL (1865-1946). American-born British essayist and critic. Born in Philadelphia, Oct. 18, 1865, he left the U.S.A. in 1888, becoming a naturalised British subject in 1913. He was educated at Haverford College, Harvard university, and Balliol College, Oxford. Noted for the brief exquisite essays and delightful aphorisms collected in *Trivia*, 1918; *More Trivia*, 1921; and *Afterthoughts*, 1931, his work ranged from pamphlets on the English vocabulary to the editing of authors so diverse as Donne and Santayana. The *Youth of Parnassus* (short stories) appeared 1895; a biography of Sir Henry Wotton, 1907; *Songs and Sonnets*, 1909; *On Reading Shakespeare*, 1933; *Reperusals and Recollections*, 1936; and *Milton and his Modern Critics*, 1940. *Unforgotten Years*, 1938, was an autobiography. He died March 2, 1946.

Smith, MADELEINE HAMILTON. Scottish girl tried in Edinburgh, June-July, 1857, for murdering her lover, Pierre Emile L'Angelier. Madeleine Smith and L'Angelier met clandestinely. When the intimacy had lasted two years an eligible suitor appeared, and Madeleine implored L'Angelier to return her letters. His reply was to threaten to hand them to her father. On Feb. 17, 1857, L'Angelier told a friend that he was to see Madeleine on Feb. 19. He left his lodgings that evening in his accustomed health, but early next morning he was found writhing on the floor of his bedroom. He recovered and went to Bridge of Allan to recuperate. On March 23 he had another violent paroxysm and died. The discovery of Madeleine's letters led to a post-mortem, which established that he

had been poisoned by arsenic. Madeleine was proved to have bought arsenic on Feb. 21, March 6, and March 18, her explanation being that she used it for her complexion. A verdict of Not Proven was returned. Madeleine went to the U.S.A., where she was twice married, and died at the age of 93. *Consult* Report of the Trial, A. F. Irvine, 1857; *Splendours and Miseries*, S. Sitwell, 1943.

Smith, RODNEY, commonly known as Gipsy Smith (1860-1947). British evangelist. Born in a tent at Woodford, Essex, March 31, 1860, he was the son of Cornelius Smith, a gipsy. Beginning evangelistic work at the age of 17 under General Booth of the Salvation Army, he successfully toured Australia, Canada, and the U.S.A., as well as Great Britain, after his appointment as missionary of the Free Church Council. He served with the Y.M.C.A. in France during the war of 1914-18, and for his great services as an evangelist with the troops he received the M.B.E. He had a beautiful singing voice and was an eloquent and persuasive speaker, raising thousands of pounds for various good causes. He died on board the liner Queen Mary in Aug., 1947.



Gipsy Smith,
British evangelist

Smith, SYDNEY (1771-1845). British divine, author, and wit. Born at Woodford, Essex, June 3, 1771, he was the son of Robert Smith. Robert Percy Smith, known as Bobus, was one of his three brothers. Educated at Winchester and New College, Oxford, Sydney's intellectual gifts made him prominent at both. In 1794 he was ordained and became curate of Netheravon, Salisbury, and tutor to the sons of Michael Hicks Beach, with whom he went to Edinburgh.

In Edinburgh Smith became acquainted with Jeffrey, Brougham, and others, one result being the foundation of *The Edinburgh Review*, of which he was the first



Sydney Smith



Madeleine Smith
From a contemporary sketch

editor. During 1803-09 he lived in London, and there he made his mark as a preacher and as a lecturer. He was also a prominent figure in Whig circles. In 1809 he accepted the living of Poston-le-Clay near York, where he was farmer and doctor as well as vicar, and in 1829 he removed to Combe Florey, near Taunton. In 1831 he returned to London as canon residentiary of S. Paul's. He died Feb. 22, 1845.

Smith's writings include Peter Plymley's Letters, 1807-08, on Roman Catholic emancipation, many other letters and pamphlets on subjects dear to a Whig reformer, and numerous articles in The Edinburgh Review. He is best known, however, as the author of many witty sayings. His Wit and Wisdom was published in 1861. Consult Memoir, Lady Holland, 1855; Sketch, S. J. Reid, 1884; Life, G. Russell, 1905; The Smiths of Smiths, Hesketh Pearson, 1945.

Smith, Walter Bedell (b. 1895). U.S. soldier and diplomat. Born in Indianapolis, Oct. 5, 1895, he was educated in state schools in that town. He fought in France in the First Great War as an infantry officer, and was later on the staff; then he held various army appointments and passed through several army schools before being appointed assistant secretary to the war dept. gen. staff in 1939. He became full secretary in 1941. During 1942-1944 he served as chief of staff to Eisenhower, remaining at S H A E F until it was disbanded in 1945. He signed the German surrender document for the supreme Allied command at Reims, May 7, 1945. U.S. ambassador to the U.S.S.R. 1946-49 (he pub. Moscow Mission, 1950), he became in 1950 head of U.S. intelligence. He received an hon. K.C.B., 1944, and G.B.E., 1945.

Smith, Walter Chalmers (1824-1908). Scottish poet. Born Dec. 5, 1824, he was educated at



Marischal College, Aberdeen, and New College, Edinburgh, and in 1850 became minister of the Scottish Free Church in Pentonville, London. Later he held ministerial appointments at Milnathort, Kinross-shire, Roxburgh Free Church, Edinburgh, the Free Tron Church, Glasgow, and the Free

High Church, Edinburgh. Moderator of the General Assembly, 1893, he retired in 1894, and died Sept. 20, 1908. As a poet Smith began with The Bishop's Walk, published in 1861 under the pseudonym of Orwell. Later volumes included Oligig Grange, 1872, Hilda among the Broken Gods 1878, Kildrostan, 1884, and A Heretic, 1890. A collected edition of his poems was published in 1902.

Smith, William (1769-1839). British geologist. He was born at Churchill, Oxon. After an elementary village education he taught himself the principles of surveying, and later became a canal engineer and civil engineer. His spare time was spent in collecting fossils and observing the order in which various strata succeeded one another, his method being to identify the strata by means of the fossils they contained. His publication in 1815 of a big geological map of England and Wales was a landmark in the history of geology. In 1831 he was presented with the first Wollaston medal by the Geological Society of London. He died at Northampton, Aug. 28, 1839.

Smith, Sir William (1813-93). British classical scholar and encyclopedist. After studying at



Sir William Smith, British scholar

University College, London, and Gray's Inn, he became a master at University College School and edited works of Plato and Tacitus. His dictionary of Greek and Roman Antiquities, 1840-42, is a great contribution to classical learning. He also edited other standard works, such as A Dictionary of Greek and Roman Biography and Mythology, 1843-49; A Dictionary of the Bible, 1860-63; A Dictionary of Christian Antiquities, in collaboration with Archdeacon Cheetham, 1875-80; and with Dr. Wace A Dictionary of Christian Biography, Literature, etc., 1877-87; besides histories, grammars, and other aids to the student. The extent and variety of the work accomplished were due to his organizing power and capability for selecting suitable assistants. Editor of The Quarterly Review, 1867-93, he was knighted in 1892. He died Oct. 7, 1893.

Smith, William (b. 1886). Professional billiards player. Born at Darlington, Jan. 25, 1886, he was a linotype operator before



William Smith, billiards player

playing his first important money match in 1913, and was runner-up in the Burroughes and Watts professional tournament, which he won in 1915 and again in 1921.

Smith became British billiards champion in 1920, defeating Falkner in the final by 16,000 to 14,500. In 1921 he met Melbourne Inman, who had voluntarily relinquished the championship in 1920, in a match of 16,000 up for £500, and won by 1,861 points. He won a further three contests with Inman, and then retired from competitive billiards.

Smith, Sir William Alexander (1854-1914). Founder of the Boys' Brigade. Born at Thurso, Oct. 27, 1854, he was educated at the academy there. When in Glasgow, he founded the Boys' Brigade (g.v.) in 1883, thereafter devoting his life to organizing the movement, of which he was secretary. He travelled extensively on its behalf, visiting Canada, 1895, and the U.S.A., 1907. He served on the departmental committee on employment of boys and girls from congested districts in the Highlands of Scotland, 1909. Knighted in 1909, he died May 10, 1914.

Smith, William Henry (1825-91). British politician. Born in London, June 24, 1825, the son of



Sir W. A. Smith, founder of the Boys' Brigade



W. H. Smith, British politician

William H. Smith, who established the business of newspaper distributors now known as W. H. Smith & Son, he joined his father when a youth and enormously developed the business. In 1868 he was returned to parliament as a Conservative member for Westminster, afterwards becoming financial

secretary to the Treasury, 1874, first lord of the Admiralty, 1877, and for short periods, 1885-86, secretary for war, and chief secretary for Ireland. In 1886, on the resignation of Lord Randolph Churchill, Smith was made leader of the house of commons and first lord of the Treasury. The appointment was unexpected, but he was admittedly a great success, and he held the post until his death, Oct. 6, 1891. Since the redistribution of seats in 1885 he had represented the Strand division. His widow was created Viscountess Hambleden, and on her death, in 1913, this title descended to their son (1868-1928), who as Hon. W. F. D. Smith was M.P. for the Strand division, London, 1891-1910.

The firm of newsagents, book-sellers, stationers, printers, and binders already mentioned was founded in Duke Street, Grosvenor Square, London, in 1821, by two brothers, William Henry and Henry Edward Smith. The business was controlled entirely by W. H. Smith, 1829-46, when his eldest son was taken into partnership. Its first rly. bookstall was opened at Euston, Nov. 1, 1848; at the end of 1905 more than 200 stalls on the L. & N.W. and G.W. rlys. were given up, and a like number of shops opened in various parts of the country. The head offices are at Strand House, Portugal Street, London, W.C.

Smith, WILLIAM ROBERTSON (1846-94). British scholar. Born at Keig, Aberdeenshire, Nov. 8, 1846,

his father was a minister. Educated at the university of Aberdeen, where his career was unusually brilliant, he then went to the Free Church College at



W. R. Smith,
British scholar

Edinburgh. After serving as assistant to the professor of natural philosophy in Edinburgh and studying in Germany, he became in 1870 professor in the Free Church College, Aberdeen. In consequence of some articles in *The Encyclopaedia Britannica*, he was charged with heresy, and in 1881 was deprived of his position. In 1883 Smith was chosen professor of Arabic at Cambridge, and in 1886 university librarian. He died in Cambridge, March 31, 1894. Smith was the most prominent Biblical critic of his day, being aided by a wide knowledge of Oriental life

and literature. His researches are contained in the *Jewish Church*, 1881; *The Prophets of Israel*, 1882; *Lectures on the Religion of the Semites*, 1889. From 1881 he was editor of *The Encyclopaedia Britannica*; and he was a promoter of *The Encyclopaedia Biblica*, and a reviser of the *O.T. Consult Life*, J. S. Black and G. Chrystal, 1912.

Smith, SIR WILLIAM SIDNEY (1764-1840). British sailor. Born June 21, 1764, in London, he entered the navy at 13 and served on the N. American station. After travelling in France, Morocco, and Sweden, 1785-90, he joined as a volunteer the Swedish expedition against Russia. In 1793 he took part in Hood's action off Toulon, and commanded a frigate in the North Sea until 1796, when he was captured by the French. After two years he escaped, was given a Mediterranean command, and in 1799 undertook the defence of Acre against Napoleon, holding the place successfully for eleven weeks. He prosecuted the war off the coasts of Italy, 1806-07, upholding the rule of the Bourbon tyrants. Retiring in 1814, he died in Paris, May 26, 1840.



Sir Sidney Smith,
British sailor

Smith-Dorrien, SIR HORACE LOCKWOOD (1858-1930). British soldier. Born May 26, 1858, he went to Harrow and Sandhurst before entering the Sherwood Foresters in 1876. Between 1879 and 1898 he saw much service in Zululand, Egypt, and the Sudan. He went to South Africa in 1899 at the head of his battalion, but was soon promoted to a brigade, and later to a division. Adjutant-general in India, 1901-03, he commanded the Quetta division, 1903-07, and, having been knighted in 1904, was c-in-c. at Aldershot, 1907-12, and then held the southern command. At the head of the 2nd corps at Mons and in the retreat,

tative he gave battle at Le Cateau, Aug. 26, 1914, rather than attempt a daylight retreat. Though he

suffered heavy losses, he was able to withdraw almost unmolested in the evening, and also threw the German forces into uncertainty and confusion. The c-in-c., French, at first com-



Sir H. L. Smith-Dorrien,
British soldier

mended Sir Horace's action, but stated later that it had imperilled the safety of the whole army. Later judgements were almost entirely in favour of Smith-Dorrien. He returned home in May, 1915, having just previously been put at the head of the 2nd army. He was c-in-c. in East Africa, 1915-16, and governor of Gibraltar, 1918-23. He died Aug. 12, 1930. He wrote *Memories of Forty-Eight Years' Service*, 1925. See *Le Cateau*.

Smithfield. London district. Known also as West Smithfield, to distinguish it from East Smithfield, near Tower Hill, it lies S. of Farringdon station, between Farringdon Street on the W., and Aldersgate Street on the E. Anciently the scene of jousts, tournaments, fairs, and from 1614 to 1855 of a horse, sheep, and cattle market, it was once a place of execution and burnings of so-called heretics. Wallace was executed here in 1305, and in 1381 Sir William Walworth slew Wat Tyler. The martyrs' stake stood opposite the gate of S. Bartholomew's priory. Human remains were excavated in 1849. A martyrs'



Smithfield, London. The meat market built on the site of an old jousting field

memorial tablet was affixed to the wall of S. Bartholomew's Hospital in 1870, and about the same time the Martyrs' Memorial church was opened in St. John's Street Road. After the Great Fire of 1666 the place was a camping-ground for the homeless.

The cattle market was removed to Copenhagen Fields in 1855, and on part of its old site the City Corporation erected the central meat market, $3\frac{1}{2}$ acres, opened 1868; central poultry and provision market, 1889; and the central market for poultry, provisions, fish, vegetables, etc., in 1892. Throughout the Second Great War the market was occupied by the military authorities; and as the building was also devastated by the explosion of a rocket bomb on Farringdon market close by, March 8, 1945, it was not until the spring of 1946 that London's meat trade returned there. See Bartholomew Fair; Caledonian Market; Copenhagen Fields; S. Bartholomew's Hospital.

Smithfield College OF FOOD AND TECHNOLOGY. British institution for technical education. Founded in 1924, it is administered by the L.C.C., and offers full and part-time instruction in the technology of meat, milk, and allied foods. Students are prepared for diplomas of the Royal Sanitary Institute and the Institute of Meat. The college is at Eagle's Court, St. John's Lane, London, E.C.1.

Smith's Falls. Town of Ontario, Canada. It is situated on the Rideau river and canal, 45 m. S.S.W. of Ottawa, in Lanark co., and is served by C.N.R. and C.P.R. Textiles and agricultural implements are made. Pop. 7,159.

Smithsonian Institution. American educational institution.

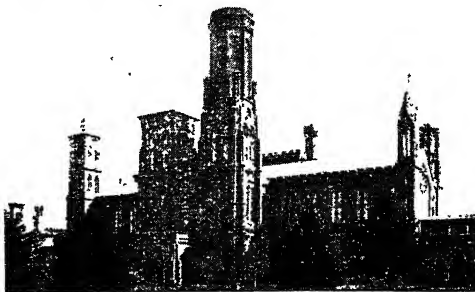
It was established by Act of Congress in Washington, 1846, through the bequest of James Macie Smithsonian, F.R.S. (1765-1829), a son of the first duke of Northumberland, who left a large sum of money for a foundation for "the increase and diffusion of knowledge among men." It is concerned mainly with problems of scientific promise, irrespective of their present economic value, which are not being investigated by other agen-

cies. Smithsonian's directions were liberally interpreted by the erection of a main building, while the nucleus of a library, which has since become of importance, and of a museum was formed; in addition, a start was made with research work. The activities of the institution spread rapidly, and it has been largely responsible for the success of the weather bureau, the U.S. national museum, the bureau of American ethnology, the national zoological park formed 1890, near Washington, the Langley aerodynamical laboratory, and the aerophysical laboratory. It has also a national collection of fine arts, which includes the Freer gallery. Research work was extended by a later large gift of funds by T. G. Hodgkins. Consult *The Smithsonian Institution*, 1846-96, ed. G. B. Goode, 1897.

Smithsonite. A zinc mineral, zinc carbonate (ZnCO_3) crystallising in the rhombohedral system. Smithsonite rarely occurs in good crystals, but more commonly in rounded aggregates (botryoidal, stalactitic, etc.) or as crystalline encrustations on other minerals; also in granular masses. It has a perfect cleavage and varies in colour from white to greenish, brownish, and bluish tints with a vitreous to pearly lustre. It may be distinguished from hemimorphite, which it often resembles, by its effervescence in acid. In addition to zinc carbonate, it may contain iron, manganese, cobalt, calcium and magnesium carbonates; rarely cadmium and indium.

Smithsonite is a common associate of galena and sphalerite; also with copper and iron ores. It is probably always of secondary origin and usually occurs in calcareous rocks, such as limestone, which it often replaces. It is one of the minor ore minerals of zinc, but in the upper and oxidized zones of zinc deposits it may occur in large quantity. See *Zinc*.

Smith Sound. Strait in the Arctic Ocean. It connects Baffin Bay with Kane Basin, separates Ellesmere Land from Greenland, and provided a route for Peary and other Arctic explorers to the Arctic ice. It was discovered in 1616 by Baffin and Bylot.



Smithsonian Institution, Washington, U.S.A. Main buildings, containing the library and museum

Smith's Prizes. Distinctions awarded to members of the university of Cambridge. In 1768 Robert Smith, master of Trinity College, left a sum of money to be awarded to the two bachelors of arts most proficient in mathematics and natural philosophy. Before 1883 they were given after examination, but since then have been awarded for essays, two each year.

Smock. Shirt-like overall garment of drill or linen once much favoured by farm labourers, characterised by the honeycomb-stitch or smocking on yoke and sleeves.

Smoke. Visible vapour or volatile matter, one of the products of combustion. The term is more specifically applied to the visible gaseous product of the combustion of coal, wood, and similar substances. Such smoke consists chiefly of carbon or hydrocarbon particles. Smoke is caused by incomplete combustion, and can be virtually eliminated by the use of proper furnaces.

A local authority may take proceedings for the summary abatement of a smoke nuisance (a) where any installation for the combustion of fuel used in any manufacturing or trade process or for working engines by steam does not so far as possible prevent the emission of smoke into the atmosphere; or (b) where any chimney (other than that of a private house) emits smoke in such quantity as to be a nuisance. The National Smoke Abatement Society, with offices in London, exists for the purpose of suggesting means for improvement in smoke abatement in large cities, and holds exhibitions and publishes papers on the subject.

Smokeless Powder. Explosive substance that burns with little or no smoke, used for military and sporting purposes. The first successful smokeless powder was that devised by Schultze, a Prussian artillery officer, about 1865, a type



James Macie Smithsonian, British scientist
From a medallion

which survives today in the Schultze sporting powders. His earliest powders appear to have been composed of grains of wood impregnated with saltpetre, but this was altered to a process comprising purification of the wood and subsequent nitration. The nitro-lignin thus obtained was then impregnated with saltpetre or a mixture of that salt and barium nitrate.

The next successful powder was that made by the Explosives co. at Stowmarket, and known since its invention in 1882 as E.C. powder. The first smokeless propellant really suited to rifled firearms was devised in 1884 by Vieille, an engineer working on behalf of the French government, who produced Poudre B. A somewhat similar powder was introduced in Ger-

a choking smoke. Caesar and Pompey had smoke screens, generated from bales of damp straw.

With the development of firearms, smoke screens were not again used until 1632, when Gustavus Adolphus surprised Tilly by crossing the Lech under cover of smoke created by the firing of wet straw. When the Dutch bombarded Landguard, near Harwich, in 1667, some ships lay to windward and fired special powder charges to create thick smoke which, drifting across the rest of the fleet, prevented the forts opening effective fire. When Charles XII of Sweden crossed the Dvina during his campaign against Saxony in 1770, he concealed his movements under cover of thick smoke issuing from tar barrels on

shell. The phosphorus is melted under hot water and poured into the shell case, which previously has been filled with hot water. As the shell fills with phosphorus, the hot water is displaced, except for a small quantity which remains on top of the filling and prevents the latter catching fire until the shell is sealed up and the air thus excluded. When the shell bursts, the phosphorus emits dense clouds of white fumes. Bombs, or grenades, on the same principle weigh 2 lb., and may be thrown by hand or discharged from mortars.

Smoke projectors release smoke while it is being created, and project it under regulated pressure. In defence they either obscure a target or conceal preparations. Their smoke is made either by burning crude oil or by injecting chlorosulphonic acid across a heated funnel. The former produces a thick black smoke, and the latter a thick white mist which clings to the ground.

Smoke weapons had a limited application in the mobile operations of the Second Great War. Projectors laid smoke screens over industrial targets as a protection against enemy bombers, and during the preparations for the Allied invasion of the Continent in 1944 they shielded from enemy reconnaissance aircraft the troops and shipping assembling around embarkation ports. They were also used preparatory to amphibious landings on enemy-occupied coasts. Dense and continuous clouds of smoke concealed the Allied preparations for crossing the Rhine on March 23-24, 1945. Smoke bombs were dropped by aircraft to mark targets. Smoke shells had a limited use in armoured operations for signalling formations on to targets.

Such screens were essential to naval operations in both wars, particularly for protecting convoys or providing cover for manoeuvres. Smoke was usually laid by destroyers, though all vessels were equipped to make it when necessary. The most common practice was to spray cold unvaporised oil into the furnaces, when, owing to the incomplete combustion of the oil fuel, dense clouds of black smoke came out from the funnels to lie on the surface of the water. Another method of making smoke at sea is to discharge chlorine and ammonia from containers on the stern of the ship: when the chemicals come into contact with the water, thick white vapour is given off and lies on the surface.

David Le Roi



Smoke Weapons. Generating a smoke screen as used in the Second Great War to cover the advance of British troops

many about 1889. In 1888 came Nobel's ballistite, and in the same year the British government introduced cordite.

A most important consideration in all smokeless powders is the question of their durability, as nitrated cotton undergoes slow changes which may lead to spontaneous explosion. In order to prevent this decomposition it is essential that the nitro-cotton be thoroughly washed, and some addition made to the smokeless powder which will arrest the decomposition. Vaseline and diphenylamine are most in demand.

Smoke Weapons. Devices to generate dense smoke for the purpose of obscuring a target or of concealing the movement of troops or ships preparatory to an attack or to cover a withdrawal. Smoke weapons were first used by the Romans, in the form of pots filled with chemicals. When thrown against an enemy, the impact of the pot on the ground caused the chemicals to combine and produce

barges. But the deliberate creation of such screens usually conferred little advantage, as until the general introduction of smokeless propellants both sides in a battle were usually enveloped in the smoke of their guns.

Not until the First Great War did the smoke screen again become an important weapon of defence or offence. In the early stages, screens were laid by lighting smoke candles in trenches anticipating attack, but the usual result was to mark the trench as a target for enemy artillery. After a disastrous incident of that nature at Loos in 1915, it was realized that smoke was a weapon best suited to attack; accordingly the smoke projector and shell were developed.

Smoke shells are fired by artillery and are similar in appearance to ordinary explosive shells. They have a comparatively thin casing and are filled with white phosphorus, a small explosive charge, fused for time or contact detonation, being provided to burst the



Smolensk, R.S.F.S.R. View of the city showing devastation caused by the fighting there during the Second Great War

Smoking. Practice of drawing into the mouth or nose the fumes of a burning vegetable substance with narcotic, sedative, or stimulant properties. The chief substances thus used are tobacco, opium, and bhang or Indian hemp (called marijuana in America). Bhang smoking is practised in central Asia and India, and from Arabia to S. Africa. Smoking, like the analogous practices of incense burning and exorcism by fumigation, may have had a ritual origin. Tobacco was smoked in the Neolithic age by the mound builders of the upper Ohio in connexion with funeral rites. Herodotus relates that the Scythians purified themselves after funerals by inhaling the fumes of burning hemp, which produced intoxication. See Calumet; Cigar; Cigarette; Pipe; Tobacco.

Smolensk. City of the R.S.F.S.R., capital of the region of Smolensk. It is situated on the Dnieper, 250 m. W.S.W. of Moscow, and is a rly. junction for Riga, Warsaw, and Moscow. Remnants of the old walls exist; a celebrated picture of the Virgin adorns the Uspenski cathedral, which is a great place of pilgrimage. Formerly of strategic importance, it was taken by the Russians in 1514, by the Poles in 1611, and regained by Russia in 1668; most of the town was burnt in 1812, when the inhabitants fled to Moscow, leaving the town to the French.

In the Second Great War, the Germans first bombed Smolensk June 30, 1941, and claimed its capture on July 16; but stubborn fighting continued in the area and not until Aug. 13 did the Russians admit the evacuation of the city. Here Hitler established his Eastern G.H.Q.; and Smolensk was made the key point of the German

defence system in Russia and the centre of a far-reaching and complicated network of defences described by the Germans as impregnable. After outflanking Smolensk on the N. and the S., the Russians re-entered it from the N. on Sept. 24, 1943, completing its recapture next day. Pop. 156,677.

Smollett, Tobias George (1731-71). British novelist. Born at Dalquhurn, Dumbartonshire, of a good Scottish family, he was educated at Dumbarton and Glasgow university. He served an apprenticeship to a Glasgow surgeon, but except for a period spent as surgeon in the



T. Smollett

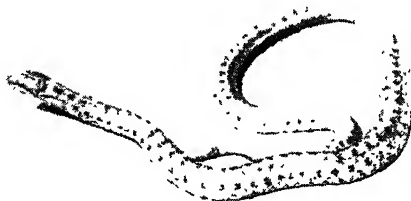
navy, 1739-44, he only practised in a desultory fashion. His first novel, *Roderick Random*, published in 1748, embodies Smollett's own experiences in the navy and elsewhere, and if his picture of life afloat in those times be a faithful one, it is small wonder that Smollett left the service in disgust. His novels generally seem to bear the impress of one who has lived in a brutal and heartless world. *Roderick Random* was a decided success, and so also was *Peregrine Pickle*, 1751, another novel in very similar strain. Both novels abound in rollicking humour, often coarse to modern taste. The characterisation is especially good in *Peregrine Pickle*.

Ferdinand, Count Fathom, 1753, is not of much interest.

During the next few years appeared a number of translations and a *History of England*. Smollett was no historian, but his lively style made his history exceedingly readable, and it enjoyed quite a vogue. His health breaking down, he was ordered abroad and ultimately settled at Leghorn, where he wrote *The Expedition of Humphrey Clinker*, published in 1771. It is in the epistolary style of Richardson, and is undoubtedly the best of his novels, quieter in tone and less brutal in its interpretation of life than his earlier works. Smollett died at Leghorn, Sept. 17, 1771. He was an unequal writer, but in parts he attains a higher level than even his contemporary Fielding, and created a gallery of characters seldom surpassed. See *English Literature*; *Novel. Consult The English Humourists of the 18th Century*, W. M. Thackeray, 1858; *Lives*, R. Chambers, 1867; D. Hannay, 1887; W. H. O. Smeaton, 1897; Fielding and S., H. H. Child, 1913; *The Later Career of T.S.*, L. L. Martz, 1942; T. S., *Traveller-Novelist*, G. M. Kahrl, 1945.

Smooth Snake (*Coronella austriaca*). Reptile common on the Continent. It is rare in Great Britain, occurring only in a few places in the S. of England. The average length of the adult is 24 ins., and the characteristic markings are two series of irregular dark spots on the grey back. It feeds chiefly on lizards and mice. See *Reptile*; *Snake*.

Smuggling. Term applied to the offence of defrauding the revenue by evading the customs duties, or by importing or exporting prohibited goods into or from a country. It is also used to denote the illicit distilling of spirituous liquors. In general the prevalence of smuggling on any organized scale varies in proportion as duties on the goods in question are high or low. The "free-traders" of Kent and Sussex, partially broken



Smooth Snake. Harmless reptile common in Europe, and occasionally found in S. England
W. S. Burridge, F.Z.S.

up by the hanging of three leaders at Tyburn in 1749, terrorised the countryside and had large storehouses for "run" goods. Cornwall and Devon were noted smugglers' counties, e.g. the Carter family at Prussia Cove, Cornwall. The chief smuggling entrepôt for the West of England was Guernsey, until a revision of customs law drove it to Roscoff in Brittany.

Legislation against smuggling in England is frequent from the 14th century. Elizabeth made a stringent enactment in 1558. The increased customs imposed by William III led to a marked increase of organized smuggling, especially in brandy, wines, tobacco, and tea. In 1732 a house of commons committee exposed its enormous spread and the grave corruption of excisemen; during two years 4,738 hogsheads of wine were smuggled into Hampshire, Dorset, and Devon alone. Walpole's reduction of wine and tobacco duties, and the Smugglers' Act of 1736, making the offence a felony, were designed to reduce the smugglers' activities by reducing their potential profits and raising the risks involved; the reduction of the tea tax in 1745 checked tea smuggling for a time, and Sir Henry Parnell's financial recommendations, 1830, included the lowering of spirits and tobacco duties to the same end.

But the general reduction of duties, and the increased dangers to offenders by the spread of rapid communications and improved coastguard services, brought organized smuggling practically to an end.

During and after the Second Great War prohibition of the import and export of certain articles, e.g. currency, and the very high rates of purchase tax led to a great increase in smuggling. Under the Customs Consolidation Act, 1876, the penalty for smuggling is forfeiture of the goods and either treble the value of the goods, £100 fine, or 2 years' imprisonment. The Exchange Control Act, 1947, prohibited the import or export of currency except with permission of the Treasury. *See* Coastguard; Customs; Excise; Preventive Service. *Consult* Memoirs of a Smuggler, from diary of Jack Rattebury, 1837; Smuggling Days and Smuggling Ways, H. N. Shore, 1892; The King's Customs, H. Atton and H. H. Holland, 1908.

Smut (*Ustilago*). Genus of small fungi parasitic upon herbs and grasses. Several are pests upon cultivated cereals, producing conditions which farmers know as

"smut," "black-ball," "chimney-sweeper," etc. The mycelial threads run between the cells of the deeper tissues and break through to the surface, where they produce their masses of microscopic brown spores which appear in the mass like soot. The flowers when attacked produce no grain; where the assault is made upon the seeds these are largely converted into spore-masses. The affected ears should be gathered and burnt as early as possible to prevent the dissemination of the spores. Wild grasses and weeds growing close to the infested crop should be carefully examined for signs of the fungus.

Seed oats suspected of contamination should be treated in one



Smut. A. Ear of diseased wheat. B and C. Single grains affected by fungus

of the following ways: (1) Immersion for five minutes in water heated to a temperature of 127°-133° F. (2) Putting the seed corn in bags and soaking for 10 minutes in diluted formalin, at the rate of 1 pint of 40 p.c. formalin to 36 galls. water for 40 to 50 bushels. (3) Spreading out the grain on a suitable surface the day before sowing, and treating it with a solution of copper sulphate (bluestone); 1 lb. of sulphate dissolved in 1 gall. of water will suffice for 4 bushels. The grain must be turned over several times with a shovel.

Spores that get into the soil retain their germinating power, and may be able to infect the next crop, in spite of care taken to purify the seed.

JAN CHRISTIAN SMUTS

Julian Mockford, Author of *Here are South Africans*, etc.

This article recounts the life of a distinguished statesman, soldier, and philosopher who, having fought the British in his youth, became a great leader of the British Empire and a worker for world peace. See also Botha, Louis; Kruger, Paul; Reitz, Deneys; S. Africa, Union of; S. African War

Jan Christian Smuts was born May 24, 1870, at Bovenplaats farm, Riebeeck West village, Malmesbury district, Cape Colony. His Boer parents were descendants of Dutch immigrants from the Netherlands, though his mother also had French Huguenot blood. After attending the Riebeeck West school, he graduated at Victoria College, Stellenbosch, and then went to Christ's College, Cambridge, where in 1892 he took a double first in the law tripos. In 1895 he began his career as a barrister and journalist, in 1896 going to Johannesburg to practise at the Transvaal bar.

Paul Kruger, president of the Transvaal republic, made Smuts his state attorney in 1898; and when British forces occupied Pretoria, the capital, in 1900, Smuts saved the treasury's gold during the evacuation, and then fought (under General de la Rey) against the British. In 1901 Smuts, as commandant, led a commando from the Transvaal through the allied Boer republic of the Orange Free State and invaded Cape Colony, where he sought to raise a rebellion among the Boers living under British rule. In this larger task he failed; but many rebels joined his commando as it rode right through the colony, through

Namaqualand, as far as the S.W. coast, where his burghers fired their rifles at a British ship, passing within range out at sea. In 1902, while besieging O'Kiep village, among the Namaqualand copper mines, he was given a *laissez passer* by the British in order that he might attend the peace conference at Vereeniging, Transvaal.

Thereafter, Smuts, under the political leadership of Louis Botha, wartime commandant-general of the Transvaal Boers, devoted himself to the task of rehabilitating the Transvaal. After the post-war administration had been organized by Lord Milner, the Transvaal was accorded responsible govt. in 1907, and Smuts was made minister for the interior. Then, in 1910, when the two former Boer republics (the Transvaal and the Orange Free State) and the two British colonies (Natal and the Cape) formed themselves into the Union of South Africa, Smuts, under the premiership of Botha, became minister of the interior, mines, and defence. In 1912 he became minister of finance and defence; and under his hand the Union defence force was established and developed. When the Witwatersrand (Johannesburg) gold-miners struck in 1913 and serious disturbances resulted, Smuts used the armed forces

to restore order; and he not only did so with greater severity in 1914 when they rioted again, but also had nine of their arrested labour leaders deported, without trial, to England.

In 1914, as minister of defence, he played a prominent part, after



Smuts at the age of 30, on the outbreak of the S. African War

the outbreak of the First Great War, in quelling a Boer rebellion which sought to overthrow Botha's Anglo-Boer govt. with its policy of reconciling the two main groups of S. Africa's white population. Then, in 1915, he followed Gen. Botha to the German colony of S.W. Africa, where the Union's invading forces quickly conquered the German forces and occupied the territory. Back in Pretoria, Smuts built up S. African forces for invading the German colony of Tanganyika in E. Africa and for the campaigns in France and Belgium. He himself, in 1916, accepted the supreme command of the British mixed forces in E. Africa, and was promoted to the rank of lt.-gen. In the following year (when he was made a P.C.) he went to London as the S. African representative in the imperial war cabinet, a position he retained until the war ended in 1918.

Smuts, in 1919, attended the peace conference in Paris as plenipotentiary for the Union with Botha, the prime minister. He signed the peace treaty "to close the war," protested that it lacked "the spirit of the new life" that Europe needed for its revival, and set high hope in the League of Nations, then instituted. Resisting the temptation to stay in the U.K. to help in rebuilding Europe, he returned to S. Africa where, three weeks after his arrival in Aug., 1919, his chief and colleague, Botha, died. He succeeded to the position of prime minister and, in 1920, retained that position after

a general election in which Gen. Hertzog (Nationalist) won 44 seats against his 41; but Smuts was given a working majority by the support of 25 Unionists (British). When the Nationalists tended to combine with the Labour members (21), Smuts found his position so difficult that he sought a stronger mandate from the people at a general election in 1921 by combining with the Unionists. Thereafter he commanded 79 votes in the house of assembly against Hertzog's 45, with Labour 9.

The fight for power became more bitter between Smuts (Anglo-Afrikaner) and Hertzog (Afrikaner). The Labour members (then chiefly British) remembered the 1913 and 1914 strikes, and never forgave Smuts for 1922,



Field-Marshal Smuts at Cambridge as chancellor of the University, June, 1948

when he stamped out the Rand revolt (organized by armed gold-miners) with the combined strength of the police, the army, the air force, the militia, and the burgher commandos. Smuts found it increasingly difficult to retain a majority in parliament; and, on his again appealing to the country in a general election in 1924, he secured, with the Unionists, only 53 seats against Hertzog, who won 63, in alliance with the Labour party, which returned 18 members.

While in the political wilderness, Smuts, who at Cambridge had written, but found no publisher for, a long analysis of Walt Whitman's poetry, at last found

time to set down the synthesis of his own philosophy which he published under the title *Holism and Evolution* in 1926. The book was at once accepted as the standard exposition of the philosophy of holism, a philosophy which regards all things in nature as consisting of wholes, each whole representing more than the sum of its component elements. During this same interlude Smuts also gathered together some of his thoughts on Africa and world politics, giving them form in his Rhodes memorial lectures at Oxford in 1929, which were published as *Africa and Some World Problems* in 1930, in which year he became F.R.S.

In 1933, Hertzog had apparently won all his Nationalist objectives; and, forced to quick action by a scheme for a reorientation of parties by a former colleague, Tielman Roos, who laid claim to the prime ministership, Hertzog formed a coalition govt. with Smuts as deputy prime minister. But Dr. F. S. Malan, one of Hertzog's cabinet ministers, refused to take office in this coalition, and chose, instead, to become leader of an opposition made up of those Nationalists who regarded themselves as the guardians of true Afrikanerdom. In 1934 the coalition took firmer shape under the name of fusion.

In 1936 Smuts became chancellor of the university of Cape Town. On the outbreak of the Second Great War in 1939, Smuts and his followers defeated Hertzog's motion for neutrality by 13 votes, and he then formed his own cabinet pledged to prosecute the war against Germany. Malan



J. M. Smuts
Smuts, elder statesman of the British Commonwealth

handed over the opposition leadership to Hertzog, who, however, resigned from parliament in 1940 and died in 1942.

As prime minister Smuts, in 1940, assumed supreme command of the Union defence forces, and in 1941 King George VI conferred on him the rank of field-marshal: he was the first dominion soldier to achieve this rank. S. Africa's whole war effort, in the Union, and in the successive theatres of operations in E. Africa, Madagascar, N. Africa, and Italy, by land, air, and sea, came under his high-level direction. In 1942 he visited London for consultations with Winston Churchill and to deliver a major war propaganda address (the switch-over from the defensive to the offensive phase) before a joint meeting of both houses of parliament. In the same year he published a collection of his speeches, *Plans for a Better World*. He asked the people of S. Africa, in the general election of 1943, to endorse his war policy; and they did so by returning him to power with a majority of 67 over all opposition groups combined; but Malan, after outmanoeuvring rival Nationalist factions, was, at the same time, firmly established as the leader of an amalgamated opposition whose members declared themselves to be the reunited national party—reunited after the divisions caused by Hertzog's coalition and by Smuts's war policy.

Symbol of the Commonwealth

Honours were heaped upon Smuts as the Second Great War ran its course. To the world he symbolised the great partnership, known as the Commonwealth, of the U.K. and the dominions. In addition to receiving high decorations, he was made a freeman of many British cities. In an optimistic mood he helped draft the United Nations charter at San Francisco in 1945, and he represented S. Africa at the victory march through London in 1946. In a less optimistic mood he listened to the wrangling at the Paris peace conference, later the same year. In 1946 also he led the S. African delegation to the United Nations assembly at New York, where he was attacked for his policies *vis à vis* mandated S.W. Africa and the population of Indian origin in the Union.

During the royal visit to S. Africa, 1947, the king conferred on him the Order of Merit. But, meanwhile, Malan was steadily closing the ranks of Afrikaner-

dom; and in the general election of 1948 he triumphed over Smuts on a platform of home politics, just as Hertzog had triumphed over him in 1924. It was a narrow victory—Malan, supported by N. C. Havenga's Afrikaner party, 79; Smuts, supported now by a changed and dwindling Labour party, 75—but it sufficed to put Smuts out of office and back into the position of opposition leader. Immediately after his defeat, he went to Cambridge to be installed as chancellor of his old university. Owing to illness, he retired June 14, 1950, from leadership of his party, the United Party; and he died Sept. 11.

Bibliography. Jan Smuts, N. Levi, 1917; General Smuts, S. G. Millin, 2 vols., 1936; Grey Steel, H. C. Armstrong, 1937; General Smuts, R. H. Kiernan, 1943; In Smuts's Camp, B. K. Long, 1945; Botha, Smuts, and South Africa, B. Williams, 1946; Jan Smuts, F. S. Crafford, 1947.

Smyrna, GULF OF. Opening of the Aegean Sea, the ancient Smyrnaeus Sinus. It is situated nearly in the middle of the coast of W. Asia Minor, and has two arms. It is about 40 m. long, and at its mouth is 13 m. wide.

Smyth, CHARLES PIAZZI (1819–1900). British astronomer. Born at Naples, Jan. 3, 1819, he was educated at Bedford grammar school and became assistant at the Royal Observatory at the Cape of Good Hope, 1835. While there he observed the great comets of 1836 and 1843, and in 1845 was appointed astronomer royal for Scotland. Smyth carried out a number of important researches on spectroscopy and introduced the use of the rain band in meteorology. He died Feb. 21, 1900.

Smyth, DAME ETHEL MARY (1858–1944). British composer and

writer. Born at Sidcup, April 23, 1858, daughter of a general, she composed hymns as a child. She received a musical education in Leipzig.



Dame Ethel Smyth,
British composer
Russell

Her *Serenade* for orchestra and overture to Antony and Cleopatra were performed at the Crystal Palace, 1890, and her most famous work, *Mass in D*, at the Albert Hall, 1893. The opera *The Wreckers* was given at Leipzig in 1906; and in 1910 it became the first opera by a woman performed at Covent Garden. Subsequent works were *The Boat-swain's Mate*; *Fête Galante*; a concerto for violin, horn, and orchestra; *The Prison* (cantata). Ethel Smyth became a D.B.E. in 1922. A woman of great energy and independent outlook, a friend of the Empress Eugénie, a supporter of the militant suffragettes (she spent two months in Holloway prison in 1913), she was a brilliant writer and talker, her books including the autobiographical *Impressions that Remained*, 1919; *Female Pippins* in Eden, 1932; *As Time Went On*, 1936; and *What Happened Next*, 1940; as well as *Beecham and Pharaoh*, 1935, and a study of Maurice Baring, 1938. She died at Woking, May 9, 1944.

Snafell. Highest mountain in the Isle of Man. It is 5 m. S.W. of Ramsey, and is 2,034 ft. high. From its summit, which is reached by electric rly. from Laxey, parts of England, Wales, Scotland, and Ireland are visible.

Snaffle (Dutch *snavel*, horse's muzzle). Type of bit. It varies somewhat, but for a riding horse consists of a smooth-jointed mouthpiece of steel, with straight cheekbars. The rings for the reins are fixed in the bars, where they join with the mouthpiece. *See* Bridle.

Snail. Name applied to many gastropodous molluscs that possess an external shell. They are of world-wide distribution, the Polar regions excepted. The number of species recognized by malacologists amounts to many thousands, and fresh ones are constantly being discovered. The British list includes about 127 species, of which 81 are land snails and 46 fresh-water. There are also a great number of marine snails, of which the periwinkle is a familiar example, and a few species accidentally imported from abroad



Snail. The Roman or little snail, *Helix pomatia*; top, the common British species, *H. aspersa*. W. S. Beiridge, F.Z.S.

are found about gardens and hot-houses. The British species range in size from the edible snail (*Helix pomatia*), whose shell attains a height of over two inches, to little *Vertigos*, smaller than the head of a pin; but some of the tropical *Achatinas* have shells 8 ins. long. Snails are found in all parts of the country. One species of water snail occurs only in a little mountain tarn in Killarney.

Snails love damp spots, and are most active after rain. In continued dry weather they retire underground or to sheltered spots, close the orifice of the shell with a film or epiphragm of dried mucus, and aestivate till the damp weather returns. Most snails hibernate.

The great majority of snails are vegetarians. Several British species are more or less carnivorous. Only three or four species do any serious damage to garden plants, others attacking weeds and fungi, and some restricting their attentions to mosses and other low plants. Some snails possess a very remarkable homing instinct, the common snail (*Helix aspersa*) will sleep in the same spot for the whole of its life, if no accident occurs to displace it. With few exceptions, snails are nocturnal in habit and do not roam abroad—except after rain—until it is nearly dark. They glide by wavelike movements of the foot; and their average rate of progress would amount to about a mile in a fortnight. In most cases the duration of life in the British species is about two years; but the common and the edible snails certainly live for five years. Most species are hermaphrodite and are reproduced by means of eggs. The egg of the edible snail is the size of a moderate pea, and has a white, chalky shell; and some S. American species lay eggs as large as those of a pigeon.

All land snails are edible, and many of the larger ones are much consumed on the Continent. Snail farms, on which the large edible snail is cultivated for the market, are common in Burgundy and other parts of France. Snails have long been in repute as a rustic remedy for pulmonary weakness, being either swallowed raw or made into thick broth. See Animal, colour plate; Gastropoda; Mollusca; Slug.

Bibliography. Monograph of the Land and Freshwater Mollusca of the British Isles, J. W. Taylor, 1894; British Snails, A. E. Ellis, 1926; Shell Life, E. Step, 1927.

Snake (A.S. *snaca*) OR SERPENT. Reptiles of the order Ophidia. The upper sides are clothed with small

overlapping scales, and the underside with broad plates, except in the Sea-snakes (*q.v.*), where the body is keeled below and clad with scales. The body is elongated and cylindrical, without any external limbs. There are no external ears and no movable eyelids, but the eye is protected by a fixed transparent cover. Locomotion is effected by movements of the abdominal plates, which are attached to the numerous ribs, by which their edges are raised and depressed.

The union of the several bones of the skull and jaws is so elastic that dislocation takes place readily to allow the swallowing of prey larger than the snake's head. To assist in such operations the slender, pointed teeth are all directed backward, and those of the jaws are supplemented by others on the palate. In numerous snakes certain teeth are developed into fangs, and a fold in the enamel provides a channel for the flow of venom from the poison-gland to the victim's wound. The tongue, whose forward portion divides into two slender branches, can be protruded through a notch without opening the mouth, and is so used constantly to ascertain the nature of near objects. The entire skin is shed at intervals. Separating at the lips, it is worked over the head and the snake glides out.

The embryonic stages of development take place in eggs, which have soft shells and are not incubated; in some species they are retained in the body of the parent and hatch in the oviduct. About a thousand species are known from all parts of the world with the exception of the Polar regions. They are most abundant in the tropics, where also they attain their maximum size. They are all carnivorous, and consume their prey whole. Only three species of snake occur in Britain—the grass snake (*q.v.*), the smooth snake (*Coronella austriaca*), and the adder (*q.v.*); none of them is present in Ireland. The adder is the only venomous British species. In temperate regions snakes hibernate often in company. See Anaconda; Boa; Cobra; Copperhead; Coral Snake; Rattlesnake; Reptile; Smooth Snake; consult also Cambridge Natural History, vol. 8, H. Gadow, 1901; Reptiles of the World, R. L. Ditmars, 1910; Snakes of Europe, G. A. Boulenger, 1913.

Snake, LEWIS OR SHOSHONE. River of the U.S.A. The most considerable affluent of the Columbia river, it rises in the Rocky Mts. in Yellowstone Park, near the W. bor-

der of Wyoming. It flows first S., expanding into Jackson Lake, and traverses a deep cañon in Idaho, forming the famous Shoshone Falls. Turning N., it forms the boundary between Idaho and Oregon, later flowing N.W. and W. to join the Columbia near Pasco. Its length is about 940 m.

Snake Bite. In Great Britain the only snake which inflicts a poisonous bite is the adder or viper. The tissues in the neighbourhood of the bite become swollen and painful, and may be followed by general symptoms such as giddiness, faintness, vomiting and diarrhoea, but a fatal result is very rare.

The viper and cobra families are the most dangerous of snakes, injecting their poison through hollow teeth connected with the poison glands. The cobra in Asia, the rattlesnake in N. America, the fer-de-lance in S. America, the cobra and puff adder in Africa are all names spelling danger. The sea snakes of the great oceans are also nearly all poisonous.

In a general sense snake venom acts in two ways. Either it clots the blood, so stopping the heart and circulation, or it acts on the central nervous system, rather as does the drug curare, bringing the organism to a standstill by paralysis of vital functions. Snakes seldom attack human beings. Nearly all bites are below the knee, and suitable boots and leggings are the best preventive.

Treatment consists in an immediate tight ligature of the part, and suction of the wound. Permanent of potash should be applied and the wound excised. Antidotes known as antivenins are available for intravenous injection. Sometimes these are polyvalent, but more often must be specific for the type of snake. Measures should be taken to combat shock.

Snake-charming. Ancient practice in Oriental lands, still common in Egypt and India. The snake charmer commonly claims that his power of "charming" the reptile, usually a cobra, is an occult gift. But evidence in support of this claim is entirely lacking. The business, often handed down from father to son, is a trick pure and simple, based on an intimate knowledge of the ways of the reptile, whose fangs have usually been removed. Cases are recorded where the charmer has allowed himself to be bitten by the snake, and where this is not an illusion or the reptile a non-poisonous one, it is possible that the charmer has gained a measure of immunity by



Snake-charming. Indian performer with his cobra

frequent inoculations with an attenuated preparation of venom from various serpents.

Snake-root. Popular name for several plants. Black snake-root is *Cimicifuga racemosa*, also N. American species of *Sanicula*. Button snake-root is *Eryngium yuccifolium* and several species of *Liatris*. Sampson's snake-root is *Gemiana villosa*; seneca snake-root is *Polygala seneca*.

Snake's-head (*Fritillaria meleagris*). Bulbous perennial herb of the family Liliaceae, native of Europe and W. Asia. The small bulb consists of only a few swollen scales. The large, drooping flowers are produced singly at the top of



Snake's-head. Flowers and leaves of the white and speckled varieties

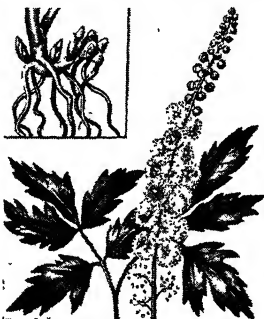
the leafy stem, and they are of a dull purple colour spotted with oval patches of a paler tint.

Snake Stone. Name given to a variety of whetstone also known as Water of Ayr stone or Scotch stone. A light grey carboniferous shale, used for polishing marble and copper plates as well as sharpening tools, it is found at Bridge of Stair on the Ayr, Scotland.

Snake Wood or **LETTER WOOD.** The heart-wood of *Brosimum aubletii*. A tree of the family Moraceae, native of S. America, it has wood of a rich brown colour, used for veneering and inlaying.

Snapdragon (*Antirrhinum majus*). This well-known herb of the family Scrophulariaceae is described under Antirrhinum.

Sneek. Town of the Netherlands, in Friesland. It is 17 m. N.E. of Stavoren and 14 m. by rly. S.S.W. of Leeuwarden, with which it has also canal connexion. Industries include distilling and tobacco making, and there is a trade in butter, cheese, etc. The Hoogeindster Waterpoort is a fine water-gate dating from 1613, restored in 1878. Sneek was entered by Canadian infantry, April 16, 1945, in an advance from Leeuwarden to prevent the German forces in the provs. of N. and S. Holland from escaping by the



Snake-root. Flower spike and foliage of black snake-root. Inset, characteristic roots

causeway shutting off the Yssel Meer from the North Sea. To the S.W. lies the large Sneeker Meer, a shallow marshy lake, partly reclaimed by drainage. Pop. 14,860.

Sneeze-wort (*Achillea ptarmica*). Perennial herb of the family Compositae. A native of Europe, Asia Minor, and Siberia, it has a long, creeping root-stock, and narrow, stalkless leaves with toothed edges. The flower-stem branches above, each branch supporting one of the rather simple flower-heads, which have white outer ray-florets and greenish inner tubular florets. The dried and pulverised rootstock is said to afford a substitute for snuff. Yarrow or milfoil (*A. millefolium*), a closely allied plant, has broader, larger leaves deeply cut into threadlike segments, and smaller, more numerous flower-

heads. The ray-florets are more or less tinged with pink or purple, and the tubular florets are yellow.

Sneezing.

Reflex action set up by irritation of the nasal mucous membrane. There is first a deep inspiration, then the glottis is momentarily closed and the abdominal muscles, contracting strongly, press the viscera against the diaphragm, thus raising the pressure in the lungs. The glottis then opens and a strong current of air is directed through the nose, with the intention of expelling the irritating particle. Sneezing is associated with hay fever, with the onset of a common cold, or with infection of the sinuses. See Nose; Smell.

Snell, HENRY SNELL, BARON (1865-1944). British politician. Born at Sutton-on-Trent, Notts, April 1, 1865, he was a farm labourer, groom, ferryman, and potman before going to Nottingham university college, London School of Economics, and Heidelberg university. An ardent Socialist and Rationalist, he became a member of the L.C.C., 1919-1925, and was chairman (when Labour first gained a majority), 1934-38. From 1922 until becoming a peer in 1931 he was M.P. for E. Woolwich. In 1930 he was a member of the imperial economic committee, and parliamentary under-secretary at the India office, 1931. He was made P.C., 1937, and C.H., 1943. From 1940 until his death, April 21, 1944, Snell was deputy leader of the house of lords. He wrote *Daily Life in Parliament*, 1930; and *Men, Movements, and Myself*, 1936.



Lord Snell, British politician

Snell, HANNAH (1723-92). An English woman soldier. Born at Worcester, April 23, 1723, she was abandoned by her husband at 20, and set forth in man's clothes to find him. She enlisted in



Hannah Snell, woman soldier



Sneeze-wort. Heads of blossom of *Achillea ptarmica*

the army, but deserted and joined the navy, saw active service in the East Indies, and fought in the siege of Pondicherry. On her return to England in 1750 she dressed again as a woman, published her adventures, and opened a public-house in Wapping. She died insane, Feb. 8, 1792.

Snell's Law. Law governing the refraction of light when passing from one medium to another. It states that the ratio of the sine of the angle of incidence (i) to the sine of the angle of refraction (r) is a constant for two media and for a given wavelength of light. This ratio is known as the refractive index of the second medium with respect to the first.

Snider, JACOB (d. 1866). Dutch-American inventor. He entered business life as a wine merchant in Philadelphia, but his main interests were in mechanical matters. He made a number of inventions, one being for a breech-loading rifle, which in 1859 he took to England. It was accepted by the British government, but the details of payment had not been settled when Snider died, Oct. 25, 1866. See Rifle.

Snipe (*Capella*). Genus of birds. Belonging to the plover tribe, three species are known in Great



Snipe. *Capella gallinago*, the common species of the British game bird
W. S. Berridge, F.Z.S.

Britain. The common snipe (*C. gallinago*) is found in most marshy districts throughout the British Isles, the majority arriving from Scandinavia in Oct.-Nov. and leaving in March. It has mottled black and brown plumage on the upper parts, white bars on the flanks, and white under parts. It is about 10 ins. in length, and its long beak is characteristic. The snipe feeds upon worms and insects in soft soil, for which it probes with its sensitive bill. It usually crouches at the approach of danger.

The jack snipe (*Lymnecryptes minimus*) is smaller in size and has the plumage mottled with buff, brown, and black, with purple re-

flections. It does not now breed in Great Britain, but occurs as a winter visitor, and is less numerous than the common snipe. The great snipe (*C. media*), often called the solitary snipe, is 12 ins. long and much like the common snipe in plumage. It is found sparsely in the E. and S. counties of England during Sept.

Snipe shooting is carried on in Norfolk and the E. counties. Requiring great skill in judging distance and pace, it is regarded as one of the most difficult forms of shooting. See Bird; Shooting.

Sniper. Military term for a concealed marksman who fires at selected targets. In the static operations of the First Great War, snipers were employed for their nuisance value in compelling troops to keep under cover even in quiet sectors. In the mobile fighting of the Second Great War, the sniper was mainly restricted to a defensive rôle in street fighting. Snipers' rifles are generally fitted with telescopic sights.

Snizort. Sea-loch in the N.W. of the Isle of Skye, Scotland. An arm of the Little Minch, it extends inland for 13 m., and has a breadth varying from 1 to 9 m. The village of Snizort stands at its head.

Snodgrass, AUGUSTUS. Character in Dickens's *The Pickwick Papers*, one of the three who accompany Pickwick on his various adventures and misadventures. Snodgrass is a reputed poet, who has never published any poems. He marries Emily Wardle, and settles at Dingley Dell.

Snoek (*Thyrstites atun*). Fish belonging to the family Gempylidae of the order Percomorphi. The name is derived from the Dutch name for pike. Found around the shores of S. Africa and Angola, it is silvery and bluish-black in colour, weighs up to 16 lb., and is sometimes 4 ft. in length. It is caught mainly by hand-line, and is edible. In 1947 10,000,000 tins of fresh snoek were exported from S. Africa, much of it to Great Britain. Occurring also in Australian waters, the fish is there given the name barracuda or barracouta.

Snoilsky, CARL JOHAN GUSTAF (1841-1903). Swedish poet. Educated at Uppsala, he was in the diplomatic service until 1879, when he began to devote his whole time to literature. He had already made his name as a poet and become a member of the Swedish Academy. His works include *Poems*, 1869, *Sonnets*, 1871, *New Poems*, 1881, and a translation of Goethe's

ballads. His collected poems appeared in 1903-04 in five vols.

Snood (A.S. *snod*). Fillet or ribbon to bind the hair, once worn in Scotland by unmarried girls.

Scott, in *The Lady of the Lake*, gives it a special significance, as declaring maidenhood, a married woman wearing curch, toy, or coif. During the 1930s the fashion of wearing a net or scarf in the same way as a snood came into favour with Englishwomen.



Snood as worn by a war worker

In fishing the word is also applied to the gut or silk cord which fastens the hook to the line, and a snood is one of the short lines attached to a line with many hooks with which cod are caught in Newfoundland waters.

Snooker. Game played on a billiards table. A combination of pool and pyramids, it is played with 15 red balls, six pool balls—black, pink, blue, brown, green, yellow—and one white cue ball which every player uses. It is a game of winning hazards only, cannons being ignored. The scoring value of each red is one, and before a pool ball can be played on, a red ball must have been potted. The values of the coloured balls are: yellow, 2, green 3, brown, 4, blue 5, pink 6, and black 7.

At the beginning of a game the red balls are placed in the form of a triangle, the apex standing as near the pink ball spot as possible, the base being parallel with and nearest to the top cushion. Yellow is on the right hand spot of the D, green on the left, brown in the middle of the baulk line, blue on the centre spot, pink on the pyramid spot, and black on the billiard spot at the top of the table. The opening stroke is made from within the D. A player continues to make strokes as long as he can pot a red and a coloured ball alternately. The coloured balls are replaced, but not the red ones; when all these are gone, the coloured balls must be taken in order of scoring value from yellow upwards. A great part of the game is defensive, the player trying to leave his adversary in such a position that he cannot play a direct stroke in a straight line to the ball next on play. This constitutes a snooker. The minimum penalty for a miss or potting the wrong ball is four points.

Credit for the invention of snooker goes to the British army. Sir Neville Chamberlain is said to have played it in Jubbulpore, India, in 1875. It did not become popular in Great Britain for more than 30 years, but today it outrivals billiards. Joe Davis won the world championship 16 times in succession from its institution in 1927. In 1948 he made a record break of 140, but H. Lindrum beat this by one the same year. Davis equalled Lindrum's 141 in 1949, but on Feb. 3, 1950, G. Chenier (Canada) made a new record break of 144. The Billiards Association is the controlling body for the game. Its h.q. are at 107, Fleet Street, London, E.C.4.

Snoring. Sound produced during sleep by vibration of the soft palate. It is generally due to breathing through the mouth, which, in its turn, most often results from obstruction of the nasal passages. Snoring in children is very often a sign of adenoids.

Snow. Ice crystals, feathery or needle-like in structure, formed in the atmosphere directly without the intermediate liquefaction of the water vapour. A snow-flake comprises many matted or clotted crystals usually broken or deformed in the conglomeration. Snow is one form of aqueous precipitation from the air, and for statistical purposes it is customary to compute a foot of freshly fallen snow as equal to an inch of rain, but this ratio is only approx., as it depends on the total depth and the texture of the snow.



Snowberry. White berries and leaves of this N. American shrub

In Great Britain snow rarely lies for many days after it has fallen; in Canada, the central U.S.A., Russia, and Siberia the winter comes with a fairly heavy fall of snow which covers the ground until the spring; the slight loss by evaporation being made good by subsequent falls.

The period during which snow lies increases with an increase of

latitude, or of elevation, until the permanently snow-covered area is reached. The lower limit in altitude of permanent snow, the snow line, is at sea level in Antarctica and Greenland, about 4,000 ft. in N. Scandinavia, 8,500 ft. in the Alps, 11,000 ft. in Asia Minor, and 15,000 ft. in the Himalayas. Apart from summer temp., however, such factors as amount of winter snow, prevailing winds, exposure and steepness of the mt. slopes exert an influence. There are thus considerable differences in the height of the snow line in a single region.

Above the snow line lie the snow fields, from which consolidated snow forms glaciers, wherein the snow crystals have been arranged to make granular ice crystals. In mountainous countries, the snow supply of valley glaciers is due to direct snowfall within the valley, avalanches or



Snow Crystal. Examples of the delicate symmetrical crystals of which snow-flakes are composed

snow slides down the valley sides, and drifts wind-blown into the valley. The upper part of the valley is the snow-field, and below this is a zone of névé or granular snow, which at a lower level becomes glacier ice. See Rain; Temperature. Consult Snow Structure and Ski Fields, G. Seligman, 1936.

Snowball Tree. Popular name for the guelder rose (*q.v.*).

Snowberry (*Symphoricarpos racemosus*). Shrub of the family Caprifoliaceae, native of N. America. It has slender, upright, branching stems with opposite, oval leaves, and spikes of small, pink, bell-shaped flowers, succeeded by large, opaque, white berries, each containing two seeds.

Snow Blindness. Painful affection of the eyes associated with some dimness of vision. It results from the glare of sunlight reflected from a large extent of snow. The symptoms usually pass off in a few days without leaving any permanent results. See Eye.

Snow Bunting (*Plectrophenax nivalis*). British song-bird, a winter visitor from N. Europe and Siberia. Only a few pairs are known to breed in the Highlands of Scotland. The plumage is black



Snow Bunting. Winter visitant to Great Britain in its summer plumage

and white in the summer, mixed with reddish brown in the winter. It is usually found near the coasts, feeding on seeds in fields and waste places.

Snow Crystal. Tiny ice-crystal which unites with others to form snow-flakes. If the temperature conditions are suitable, water vapour may condense into crystals of ice. As this takes place in

free space high in the air, the frozen molecules of water are able to arrange themselves so that the crystals form innumerable geometrical figures. The characteristic shape of the simplest ice crystal is a small flat triangular or hexagonal plate, but the majority show much more complicated structures. When the temperature is not too low, and the ice-crystals are more or less wet, snow-flakes consist of a very large number of crystals matted or clotted together. See Snow. Consult Snow Crystals, W. A. Bentley and W. J. Humphreys, 1932 (with 2,000 photographs).

Snowden, PHILIP SNOWDEN, Viscount (1864-1937). British politician. Born at Keighley, Yorks, July 18, 1864, he entered the civil service, but left, 1893, to devote himself to political and journalistic work for the socialist movement. A prominent member of the Independent Labour party, of which he was chairman, 1903-06 and 1917-19,



Viscount Snowden, British politician

he was M.P. for Blackburn, 1906-18, and for Colne Valley, Yorks, 1922-31. He became a dominant figure in the house of commons, mainly by reason of his pugnacious and incisive oratory. He served on several important royal commissions, and was chancellor of the exchequer in the first Labour govt., 1924, and again in 1929-31. A sound and orthodox economist, he gained considerable approval beyond the ranks of his own party for his firm insistence, at the Hague conference of 1930, on

B.B.C. from 1927 to 1933, and evinced particular interest in the development of opera in Great Britain. Her interest in the arts was further seen in her connexion with the Royal Academy of Dramatic Art and the Royal Academy of Dancing. An ardent temperance advocate, she served as president of the Band of Hope union. Her publications included *The Feminist Movement*, 1919.

Snowdon (Welsh *Eryri*, eagle top). Mountain of Carnarvonshire, Wales. Situated 10 m. S.E. of Carnarvon, it is the highest mountain S. of the Tweed, with five distinct peaks, the loftiest, Y Wyddfa, attaining 3,560 ft. The ascent is made N. from Llanberis, S. from Beddgelert, E. from Capel Curig, and W. from Snowdon station. It gives its name to the mountainous dist. of Snowdonia, a royal forest in the reign of Edward I, which extends across the country from near the head of Cardigan Bay in the S. to the vicinity of Conway in the N. The Snowdon rly. runs from Llanberis to the summit. Except in the finest weather the mountain top is shrouded in mist. See Railways illus. facing p. 6848.

Snowdrop (*Galanthus nivalis*). Bulbous perennial herb of the large family Amaryllidaceae. It is a native of Europe and W. Asia. The small oval bulb produces two strap-shaped leaves, and a solitary white flower on a long stalk. The three white sepals are larger than the three notched petals, which are each marked on the outside with a yellow-green horseshoe patch, and inside have grooves which contain nectar. See Bulb.

Snowdrop Tree (*Halesia carolina*). Small tree of the family Styracaceae, native of N. America. It has alternate, oval lance-shaped leaves and white bell-shaped flowers in sprays. See Inflorescence illus.

Snowflake (*Leucojum vernum*). Bulbous perennial of the large family Amaryllidaceae, native of

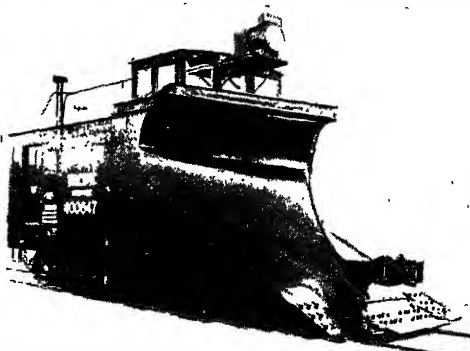


Snowflake. Flower cluster and leaves of the summer snowflake

Europe. It is similar to the snowdrop, but has more numerous, much longer leaves, and there are usually two flowers. These are white with green tips to the sepals. In another and larger species, the summer snowflake (*L. aestivum*), there may be as many as six flowers.

Snow Hill. London street, connecting Holborn Viaduct and Farringdon Street, E.C. It was formerly the highway between Holborn Bridge and Newgate Street, but was reconstructed on a smaller scale in 1867. John Bunyan died in Snow Hill, 1688. Midway down the hill stood the old coaching inn called The Saracen's Head, immortalised by Dickens in Nicholas Nickleby. Offices and the entrance to a police station now occupy the site. The street suffered heavily in the German air-raids of 1940-41, many buildings, especially on the S. side, being totally destroyed.

Snowplough. Machine for clearing snow from roads and rly. tracks. In countries where the snowfall is seldom great, the rly. plough is a vehicle with a sloping front, out of which rises a wedge-



Snowplough. Single-track steel snowplough in action on the Canadian Pacific Railway



Snowdon, Carnarvonshire. Highest mountain in Wales seen from Crib Goch. Llyn Llydaw and Llyn Glaslyn in the foreground

British rights under the Young scheme of reparations. In the economic and political crisis of 1931 he supported Ramsay MacDonald, and remained in the National govt., violently attacking his former colleagues in speeches before the subsequent general election. Created Viscount Snowden of Ickornshaw, 1931, he was



Snowdrop. Leaves and flowers of the familiar British wild flower

lord privy seal until the following year, when his hostility to any form of protection led to his resignation. He died suddenly, May 15, 1937. He published his Autobiography, 1934.

His wife, Ethel, was also an active socialist, internationalist, and public worker. She was one of the original governors of the

shaped box. The slope lifts the snow, and the wedge throws it to the side. The plough is pushed by two or more locomotives. In regions of heavy snowfall clearing is done by the rotary plough, which carries in front a transverse wheel made up of a number of cones resembling pencil-sharpeners on a large scale. The revolving wheel slowly eats its way into the drift. The snow is flung out by centrifugal force through an opening in a hood almost touching the cutters. A plough of this type can penetrate easily snow 15 to 20 ft. deep.

Snow Rollers. Term applied to cylinders of snow formed and rolled along by a strong wind. Snow rollers rarely occur in the British Isles, but they were observed on Jan. 10, 1945, at Full Sutton, Yorks, the largest being 3 ft. in length and 1 ft. 6 in. in diam. They were composed of snow loosely packed in layers.

Snow Shed. Structure to protect rlys. from snow. Where the track runs along a hillside, the roof of the shed is carried into the slope and has a slight inclination outwards, so that any moving snow is thrown clear of the rails. Very stout timber is used throughout, and extra solidity given by anchoring to cribs of logs and stones.

Snow Shoes. Appliances with long, broad, flat surface enabling the wearer to travel over snow.



Snow Shoes. A variety worn in Russia

They have a framework of hickory or some other strong, tough wood, filled up with a webbing of hide. Those of the Eskimos are circular or triangular, some 18 ins. in length, while those of the N. American Indians are longer and narrower, the Crees having hunting shoes as long as 6 ft. Canadian snow shoes run to about 3½ ft. long, and 15 or 18 ins. broad.

Snow White AND THE SEVEN DWARFS. Fairy tale included in the collection made by the

brothers Grimm, 1812-22. It was the basis, under the same title, of the first full-length musical cartoon film, which was made by Walt Disney (*q.v.*) and shown in 1938. The film was memorable for its technical excellence, its humorous characterisation, especially of the dwarfs (who were given the names of Happy, Doc, Sneezy, Bashful, Sleepy, Grumpy, and Dopey), and the tuneful songs composed by Frank Churchill, *e.g.* Whistle While You Work, Some Day my Prince will Come. With a Smile and a Song.

Snowy Range. Name sometimes applied to the Colorado section of the Rocky Mts.

Snowy River. River of Australia. It rises near Kosciusko in the Snowy Mts. in New South Wales, flows for short distances N.E., S.E., and then, in general, S., with a great bend to the left to receive the McLaughlin and Delegete, to enter Victoria, and continues S. to Bass Strait. Settlement began in the valley about 1830. See Australia in N.V.

Snuff. Finely ground tobacco with various salts and flavours added during manufacture, and used for inhalation through the nose. The additions are only such as are allowed by law. Medicated snuffs are sold subject to *ad valorem* duty. They have as a foundation substances other than tobacco.

Snyders, FRANZ (1579-1657). Flemish painter. Born at Antwerp, he studied under H. van Balen and P. Breughel the younger, and painted "still life" and pictures of hunts. Rubens employed him to introduce fruit, etc., into his pictures. Except for visits to Brussels and Madrid, he passed his life at Antwerp, and died there.

Soane, SIR JOHN (1753-1837). British architect. Born at Whitchurch, near Reading, Sept. 10, 1753, he studied under Henry Holland, at the R.A. schools, and in Rome. Returning to England in 1780, he was appointed architect to the Bank of England in 1788, and rebuilt that structure in the Roman Corinthian style, 1800. Other works by Soane include the Dulwich College picture gallery, 1812, and restorations of colleges of both Oxford and Cambridge.



After Lawrence

He became A.R.A. in 1795, R.A. in 1802, professor of architecture in 1806, and was knighted in 1831. After 1833 he devoted himself to extending the museum of antiquities and his own designs, which he had already installed in his house (*v.i.*). He died Jan. 20, 1837.

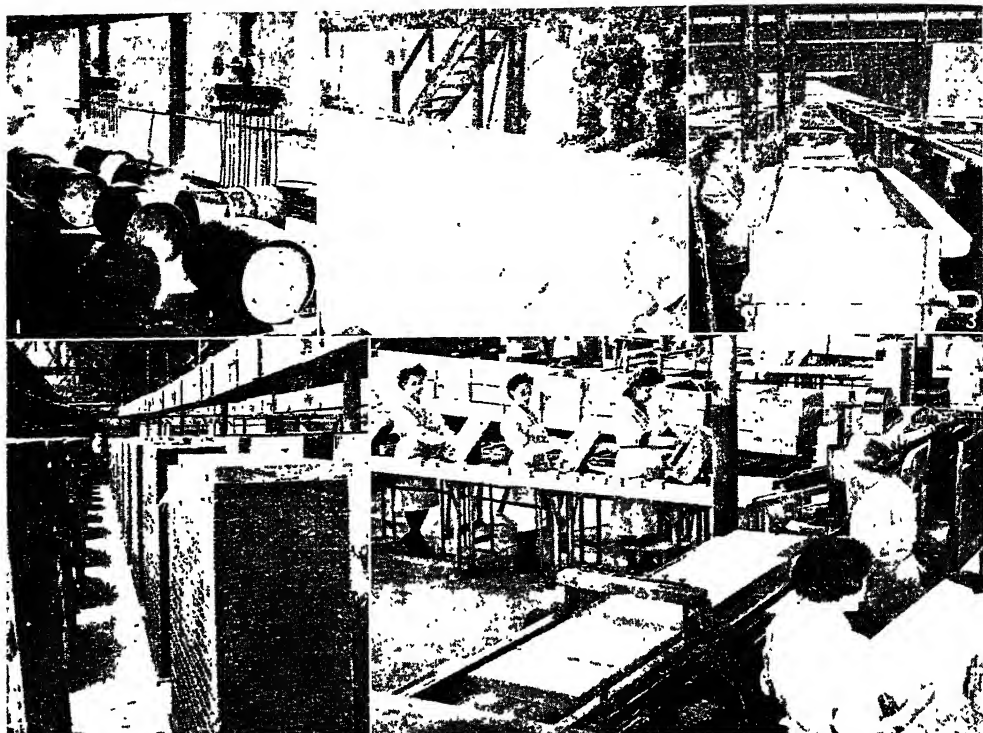
Soane Museum. The private house, in Lincoln's Inn Fields, London, of Sir John Soane (*v.s.*),



Soane Museum, London. The house on the N. side of Lincoln's Inn Fields

containing his collections of antiquities, works of art, and MSS. Maintained under an Act of parliament secured by Soane in 1833, the museum is an intact example of a private house and museum arranged precisely as it was left by its founder. The house, built 1812, is remarkable for its architectural features. The contents include two important series of paintings by Hogarth, The Rake's Progress and The Election, and there are paintings by Reynolds, Turner, Lawrence, Canaletto, and Watteau. The sarcophagus (*q.v.*) of Seti I (*c.* 1370 B.C.), discovered in 1817, is another feature, while the MSS. include illuminated missals, John Thorpe's book of architectural drawings (*c.* 1590-1630), and large collections of the works of Wren, Chambers, the Adam Brothers, and Soane himself.

Soap. Detergent or cleansing substance produced by the action of caustic soda or caustic potash on animal or vegetable oils or fats. In the first century the ashes of wood were causticised by boiling with lime, and so formed a solution of caustic potash, which, boiled with oils or fats, produced a soft soap, *i.e.* a potash soap, that was then boiled with salt to convert it into a hard soap, *i.e.* a soda soap.



Soap. Processes in its manufacture. 1. Oils and fats in barrels being heated over steam jets to melt out their contents. 2. Pan in which the ingredients are boiled together to form the glycerine and soap mixture. 3. The frame room, in which the liquid soap cools and solidifies in steel frames. 4. Solid blocks of soap cut into slabs by means of a frame strung with piano wires. 5. Bars cut from the slabs being fed into machines which reduce them to tablets, stamped with the maker's name, and finally packed into boxes

By courtesy of Lever Brothers and Unilever, Ltd

It was not possible until after the establishment of the Leblanc soda process in England in 1824 to attempt the manufacture of soap on a large scale. The modern developments of the industry, however, began after solid caustic soda became an important article of commerce in 1850, and the abolition of the taxes on soap in 1853.

Modern soap manufacture involves the same chemical reactions as did the ancient. In the cold process for hard soaps, melted coconut oil at 35° C. is stirred with a 32 p.c. solution of caustic soda in exactly the right proportions; heat is developed by the reaction which is allowed to go on for 24 hours. The soap so produced is quite satisfactory, when the process is properly conducted. It contains all the glycerine produced by the chemical reaction $C_3H_5\bar{A}_3 + 3NaOH = C_3H_5(OH)_3 + 3Na\bar{A}$ (oil) (c. soda) (glycerine) (soap) where \bar{A} stands for the fatty acid radicle. Certain proportions of other oils may be mixed with the coconut oil. These soaps, "marine soaps," can be used for washing with sea-water.

The hot process is applicable to any oils or fats by boiling them with caustic soda for hard soaps or caustic potash for soft soaps, but a little of the more expensive potash is mixed with the soda in making certain toilet soaps, and a little soda is added to stiffen soft soaps in summer time. Most of the best soaps are prepared in this way. Glycerine is obtained as an important by-product. The oils or fats are melted and churned by means of steam in large soap coppers, and a dilute solution of caustic soda gradually run in, until the mixture consists of the sodium salts of the fatty acids, i.e. the soap, and glycerine with water. It is, however, necessary to use more caustic soda than is theoretically required, in order to saponify all the oil, but this is removed in the salting-out process. On adding salt the soap separates from this mixture, and rises to the surface; the watery layer containing salt, glycerine, and the excess of caustic soda forms the lower layer.

The curdy soap granules are boiled with fresh dilute caustic soda to complete the saponification of the

oil and improve the colour, then salted out again. The soap, which retains 30 to 35 p.c. of water, is then brought into condition, perfumed, coloured, medicated, etc., milled, moulded, and packed. The composition of the finished soap is, approximately, fatty acid (anhydrides) 62 p.c., combined soda (as Na_2O) 7½ p.c., water (including a little glycerine, salts, etc.) 30½ p.c.

Soft soaps are made by the hot process, simply by boiling linseed oil with a solution of caustic potash, under proper conditions, with the addition of an excess of alkali in the form of potassium carbonate at the end to render it transparent. The excess of water is removed by boiling. There is no salting out, and consequently all the glycerine produced remains in the soft soap. The average composition is fatty acids (anhydrides) 39 p.c., combined potash (as K_2O) 7 p.c., glycerine, water, etc., 54 p.c.

In chemical nature, soap is usually a mixture of oleate, palmitate, and stearate of sodium, or of potassium in the case of soft soap. The oleate and palmitate predominate when made from vege-

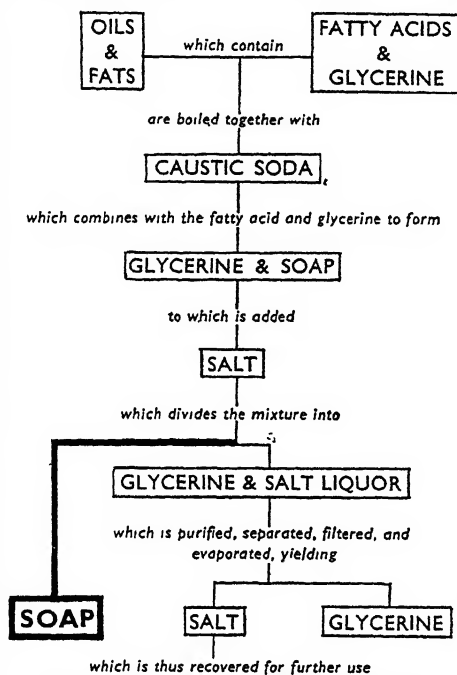
table oils, the stearate when from animal fats, e.g. tallow. The stearate forms the harder soaps, e.g. curd. With the calcium and magnesium salts present in ordinary water, soap reacts to form the oleate, palmitate, and stearate of calcium (calcium soaps), or magnesium, and these compounds, being insoluble, collect as a scum or curd in the water used for washing. These soap-destroying properties constitute the hardness of a water. When an acid is added to an aqueous solution of a soap, it is decomposed with the separation of the free fatty acid of the soap, which floats on the surface. The so-called cereal soap is made by the action of caustic alkali on starchy material in a way similar to the cold process for hard soaps. It possesses good lathering and cleansing properties. The soaps used in medicine are made with olive oil and are neutral.

In addition to the vegetable and animal oils, considerable use is now made of hardened fats, that is soft fats and oils converted to hard fats by hydrogenation. Rosin colophony (*see* Resins) is also an important addition to the raw materials used by the soap maker. Rosin consists almost entirely (90 p.c. at least) of free resin acids which combine with alkali to form soap. Household soap often contains considerable quantities of rosin. Rosin is cheaper than fats and oils but does not yield glycerine. Up to 40 p.c. rosin soap can be incorporated, but such large quantities have an adverse effect upon the physical qualities of the product. During recent years there have been considerable developments in the preparation of resin derivatives, notably hydrogenation products, which appear to be of use in the preparation of soaps.

An important development has been the introduction of a continuous process for soap making. The details of the plant are complicated, but briefly it consists in passing the molten fat and the

aqueous alkali solution through a series of reaction vessels in opposite directions.

The soap is finally separated after the addition of brine by centrifugal force. The advantages of the process are the great reduction in steam consumption, higher recovery of glycerine, and less loss due to impurity, mainly because the reactants are under the influence of heat for a shorter time.



Soap. Summary of the process of manufacture

Developments have also taken place in exploiting the detergent qualities of sulphonated fatty alcohols. The primary alcohols of this type are derived from natural fats, but the secondary alcohols are derived from petroleum and thus constitute a new source of detergents.

For some purposes these possess considerable advantages, e.g. the range over which they are effective and their stability to hard water. In wool scouring they give a soft fluffy result free from stickiness and any tendency to felt.

Soap Berry (*Sapindus saponaria*). Tree of the family Sapindaceae, native of tropical America. With alternate leaves and small greenish-white flowers, it has fleshy fruits containing hard, black, round seeds that have been used as beads and buttons. The outer coverings of the seeds when soaked in water

make a lather, and are used as soap. The root has the same property in a lesser degree.

Soapstone or **STREATITE**. In geology, the name sometimes given to the massive variety of talc. Generally white or blue-grey to green in colour, soft and heat-resisting, it is extensively used in laboratory furniture, electric switchboards, etc. It is rarely found pure. *See* Talc.

Soapwort or **FULLER'S HERB** (*Saponaria officinalis*). Perennial herb of the family Caryophyllaceae. A native of Europe and W. Asia, it has a creeping white rootstock and straight stems with oblong, lance-shaped leaves. The fragrant lilac or white flowers are in clusters. The leaves, bruised in water, produce a lather which may be used in washing.

Soar. River of England. It rises on the E. border of Warwickshire and flows 40 m. N.E. and N.W. to the Trent, about 11 m. S.E. of Derby. It passes through Leicestershire, forms part of the boundary between that county and Nottinghamshire, and is navigable to Leicester.

Sobat. River of the Anglo-Egyptian Sudan. Formed by the junction of the Baro and Pibor, it rises in the S.W. of the Abyssinian highlands and runs N.W. to the Nile, which it enters at Sobat, 525 m. S. of Khartum. The total length from the source of the Baro is about 460 m. The Sobat joins the Bahr el Jebel or Mountain Nile, and its silt deposit gives rise to the name Bahr el Obeid, or White Nile, for the united stream. *See* Nile.

Sobieski. Name of a famous Polish family. James Sobieski, a noble of Cracow, was the father of John Sobieski, who became king of Poland. John's granddaughter, Maria Clementina, became the wife of the Old Pretender. *See* John, king of Poland.

Sobraon. Village on the Sutlej, Punjab, India. Here on Feb. 10, 1846, a battle was fought between the British under Sir Hugh Gough and the Sikhs. The Sikhs, 20,000 strong, were entrenched with the river behind them, and the British guns were unable to damage them seriously. The infantry, however, reached the entrenchments, and, after a stubborn fight, the Sikhs were put to flight, losing about 5,000 men. *See* Sikh Wars.

Socage. Word used for a certain kind of land tenure. Such land was held on the payment of rent or services, and the holder was not a villein but a freeman.

His obligations included the duty of attendance at the court held by the lord of the manor. After the decay of feudalism socage tenure became freehold. *See* Land; Manor; Soke; Villeinage. *Consult* Domesday Book and Beyond, F. W. Maitland, 1897.

Social Contract. THE. Term common in the philosophy of the 17th and 18th centuries, embodying the old theory that civil society originated in a contract. It has been supported by very diverse arguments, and used to support conflicting conceptions. Generally, it assumed an original state of nature in which everyone did as he liked; from which state of miserable anarchy men escaped by making a contract with someone to protect them, thus organizing society. In England this theory was accepted by such opposed thinkers as Hobbes and Locke, and in France Rousseau afterwards gave a new meaning to the term.

In the *Contrat Social*, published in 1762, he discarded the theory of an original state of nature, and sought his arguments from philosophy rather than from history. His state, an ideal conception, is founded on man's universal desire for freedom, which can only be secured by a contract which each makes with all, and in which each surrenders his will to receive it back again as part of the whole. In this state the people themselves are sovereign, and affairs are settled by the general will, of which each man forms part. *See* Rousseau; State.

Social Credit. Economic philosophy first expounded in 1919 by Clifford Hugh Douglas (*q.v.*), in an article in the *English Review*. It is based on the principle that the individual is the all-important unit in society. Accordingly, the only object of production being consumption, the interests of the consumer should be paramount. Douglas maintained that the chief cause of the recurring economic crises in the world was artificial financial restrictions, which limit consumption in ways not easily perceived by the layman. He propounded the Social Credit idea in a twofold manner: (1) by an analysis of costing, which became known as the $A + B$ theorem; (2) by a set of proposals of which the essentials were the establishment of a national credit authority; the financing of the consumer, apart from the employment system, by means of a national dividend based on production; the appli-

cation of a price-adjustment mechanism "at the retail end"; and the issue of new credits for new production.

The idea attracted the attention of A. R. Orage, editor of *The New Age*, who opened his columns to a series of articles by Douglas which came to be accepted as the "bible" of the movement. Many politicians, attracted by the plan, were dubious about its revolutionary financial implications.

In Canada, an Alberta schoolmaster, W. Aberhart, organizing a Social Credit party in 1935, obtained a sweeping electoral majority in the prov., and formed the world's first Social Credit govt., repeating his victory in 1940. After his death his successor, E. Manning, won 51 out of 57 seats in 1944, and again held his position in 1948. But after more than 13 years of popular approval, Social Credit was still not in practice in Alberta, because the British North America Act, 1867, under which Canada became a dominion, imposed federal control over all forms of monetary issue, and the privy council, on appeal, repeatedly maintained the provisions of the Act.

In the U.K. the Social Credit party, though small in numbers, was active, one group of its supporters, uniformed in green shirts, hold occasional public demonstrations.

Socialism. Word introduced by Pierre Lerroux in 1838, and used since then to denote various methods of reorganizing society and the plans, practical measures, and political activities for effecting the changes necessary to bring them into being. In spite of the wide differences of theory, all types of socialism substitute collective for individual ownership and management over a large part of the economic field; consequently socialism has often been called collectivism.

Without exception socialists deny that individual profit-making can be an efficient basis for the economic activity of society, and desire to substitute for it the motive of service to the community. This, it is thought, may be assured through the communal ownership and control of the means of production and distribution, making possible a scientific organization of the productive forces of society and a more equal distribution of the social income.

The principal differences among socialists concern chiefly the measures to be taken and the

speed with which socialism can be attained. The Fabians, who have had a great influence in Great Britain, would "make haste slowly," so that the changes effected in the economic framework through legislative action may reflect changes in men's ideas. But the revolutionary socialists think of socialism as a ready-made economic system to be installed instantly, if need be after a revolution. They believe that socialism is inevitable, and that given the opportunity, men's minds could be changed to attune with the system. This difference of approach represents the gulf separating the western socialism from that of Russia.

Founders of Socialism

As a political doctrine, socialism is linked with many others, *e.g.* Utopianism, radicalism, anarchism; and with isolated writings and events during many centuries. But as an active and organized political force it is a product of the industrial revolution of the 18th-19th century, the concentration of capital, and the aggregation of workers in large factories. The writings of Tom Paine and William Godwin contributed; Ricardo, through his economic writings, stimulated anti-capitalist schools of thought; Robert Owen in Great Britain, and Fourier in France, made plans for ideal communities; Saint-Simon urged the need for transferring power from the old governing classes to the "industrials," so that science could be applied to solve the problems of poverty. All these influences were in various degrees focused by Karl Marx and Friedrich Engels in their Communist manifesto, 1848, "the year of revolution." Marxist ideas spread rapidly on the Continent, but eventually had much less influence than was originally expected. In Germany, the essential principle of Marxism was abandoned in 1875, when the socialists decided to aim at the democratisation of the state instead of at its overthrow and the institution of a new order. In France socialism declined for several years after the failure of the Paris Commune in 1871. In both countries, as elsewhere in western Europe, there remained a gap between the reformist and the revolutionary socialists.

In the U.K., H. M. Hyndman founded in 1881 the Social Democratic Federation, which adopted a full Marxist programme; but it was able to achieve little, partly

because of the rise of the trade union movement, partly because the numerous parl. reforms introduced held promise of reform without revolution. In 1883 the Fabian society was founded. Its members were socialists, men and women who aimed "at the reorganization of society by the emancipation of land and industrial capital from individual and class ownership and the vesting of them in the community for the general benefit. . . . For the attainment of these ends the society looks to the spread of socialist opinions and the social and political changes consequent thereon." Its instruments were education and legislation; and it achieved much in both directions. Fabian socialism became the theoretical basis of British socialism when Keir Hardie and his associates founded the Independent Labour party in 1893; during the 20th century it inspired informally, perhaps, most of the policy of the Labour party, and much of that of the trade union movement. The doctrine of the "inevitability of gradualness" came to be accepted by almost all the British socialist leaders. One social reform was a stepping-stone to another, which in its turn entailed further structural changes in the social and economic organization of the state. Considerable changes in that structure had been made before the accession of the Labour party to power in 1945 by the extensive socialisation that had taken place through municipal government.

Marxian Socialism in Russia

The political and social conditions of tsarist Russia were basically different from those of western Europe. In the revolution of 1917 the removal of one tyranny left a void; it was filled, temporarily at least, by another tyranny: the dictatorship of the proletariat. Thus in one country at least the Marxian dream came true. The Bolsheviks (literally, the majority) called themselves Communists, to recall the Communist manifesto of 1848; and from 1917 the word communism was normally used to mean the policy and programme of the Communist party of the U.S.S.R. and of those groups in other countries which accepted its lead. At first the Russian Communists expected socialist groups elsewhere in the world to follow their example, and the Communist international bureau (Comintern, *q.v.*) was active in many countries, but without signifi-

cant results. In 1943 this bureau was disbanded, but the resurgence of extreme socialism among many who had been active in resisting the Germans in territory occupied by them during the Second Great War led to the establishment of the Cominform, a new international Communist bureau.

For and Against Socialism

Chief arguments advanced by opponents of socialism are: (1) there is no adequate substitute for private profit-making as an economic motive; and if it is suppressed or given inadequate scope for legitimate exercise, either individual initiative and energy will be weakened or men will seek personal profit illegitimately, and society will become corrupt; (2) private ownership and control of business undertakings can alone provide the necessary flexibility and willingness to undertake risks; (3) the socialist state leaves unsolved the problem of who is to do the drudgery of the community, and gives no guarantee that this work will be allocated more fairly than under capitalism; (4) socialism involves a great increase in the number of those whose sole work is to prevent others from doing anything, and the system of planning, licensing, quotas, etc., which it establishes is itself a serious brake on useful economic activity and a serious cause of frustration and waste; (5) socialism necessarily imposes great restrictions on the freedom of the individual, not only by deciding in what economic activities he may engage, but by deciding what he may *not* do; (6) through the extreme centralisation of power, it would be possible for an unscrupulous combination of men to establish a continuous dictatorship; (7) it is unwise to rely on only one motive, service to the state, among the many human motives, others being *e.g.* the urge for good works, the desire for personal gain, the love of praise, the thirst for power.

In reply, socialists contend: (1) profit-making is a strong motive only because of the power that money gives in a capitalist society; (2) private profit-making often leads to the deliberate creation of shortages, and this is anti-social; (3) in large-scale enterprise, ownership is frequently separated from control, and forms of socialised undertaking can be given similar control, but with the added safeguard that the managers will be responsible to parliament; (4) with the large aggre-

gations of capital in contemporary industry, there is a concentration of power that is not accountable to parliament and is a serious challenge to democracy; (5) economic freedom is denied, under capitalism, to the vast majority of the population; (6) in a complex industrial structure there must be planned investment, if miscalculation and unemployment are to be avoided, and this planning, being subject to parl. control, would aim at the general well-being of the population instead of the enrichment of a few. See Capitalism; Communism; Syndicalism.

H. Watson

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Social Security. Term used officially in the U.K. in 1944, when it was announced that a ministry of Social Insurance was to be set up to administer the whole field of social security, covering allowances for unemployment, sickness, and accidents, old age and widows' pensions, family allowances, and death and maternity grants. See Beveridge Report; Insurance, National. Consult the White Paper, Cmd. 6550, 1944.

Social Security Act. Act of the U.S. Congress signed Aug. 14, 1935, by Pres. F. D. Roosevelt, who is said to have regarded it as the cornerstone of his administration in domestic affairs. It was amended in 1939 and 1946. It covers old age and survivors' insurance, administered directly by the federal govt., and several other benefits administered through federal grants to the states, *e.g.* unemployment insurance, public assistance, and maternal and child welfare especially in rural areas and those suffering from economic distress. The act was originally administered by a non-partisan social security board of three members, of which John G. Winant was chairman. In 1946 the functions of the board were transferred to a federal security agency.

Social Services. Term used in the U.K. for collective financial provision organized through central

and local govt. agencies primarily to promote the physical and mental health and well-being of the population, and thus indirectly the prosperity of the whole community. Such provision includes expenditure out of taxes and rates on such activities as education, public libraries, public baths and similar amenities, housing, national assistance, social security (*v.s.*), social salvage (reformatories, mental hospitals, etc.); but not expenditure on sanitation, roads, fire service, etc., and probably not food subsidies or other taxational devices for controlling the price-level or redistributing the national money income. The total provision for social services made in the 1947 British budget was £441 million, of which half was used in the form of grants-in-aid to local authorities. The contribution from rates was c. £400 million. Consult National Income and Expenditure of the U.K., 1938 to 1946 (Cmd. 7099); Economic Survey for 1948 (Cmd. 7344).

Society. Association of persons united by common interests in certain subjects, or for the furtherance of particular objects. Innumerable classes of societies are in existence, and the most important are described under their separate headings. See Academy; Friendly Societies; Royal Society, etc.

Society (Lat. *socius*, companion). Mankind considered collectively or as a community; more particularly, a number of persons associated for a common interest or distinguished by particular qualities, *e.g.* of social organization. Society is studied to discover (a) its origin, development, and history in different areas; (b) the effects of one society on another through migration, conquest, etc.; (c) the sources, features, growth, and effects of culture at different times and in various areas; (d) the different types of kinship, marriage, and family relationship; (e) the organization of occupational and other associations; (f) the functions of religion and magic; (g) the social controls (moral codes, administration of justice, basis of authority, etc.); (h) economic organization at different levels of culture.

Generally speaking, primitive society seems to have been characterised by a lack of differentiation of function, particularly the separation of the religious, the economic, and the legal. Emphasis has been laid latterly on group psychology, *i.e.* on the social mind as a force in

society, with the object of discovering the causes of contemporary social problems. See Anthropology; Psychology; Sociology.

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Society Islands. French archipelago in the South Seas. It includes Tahiti (*q.v.*), and many

other islands and islets. The capital is Papeete. Of its area of c. 650 sq. m., Tahiti has 600 sq. m. Most of the islands are volcanic and fringed by coral reefs. Copra and phosphates are the principal products and exports. Sugar and bananas are produced for local consumption. The island group is the administrative centre for French Oceania. The Society Islands were annexed to France in 1880, and declared for Free (Fighting) France during the Second Great War. Pop. 14,000.

THE SOCIETY OF FRIENDS

* Gilbert K. Hibbert, former lecturer, Woodbrooke Coll., Birmingham, etc.

See the articles on other branches of the Christian Church, *e.g.* Church of England; Congregationalism; Methodism. See also the biographies of Fox, G.; Fry, Elizabeth; Penn, William, and other leaders; also Jordans; Mysticism; Quietism

The Society of Friends, commonly known as Quakers, is a Christian body, numbering about 22,000 members in Great Britain and Ireland, and some 120,000 in N. America.

It began its existence about the middle of the 17th century, as a revolt of mystical or "spiritual" Christianity against the ecclesiasticism and bibliolatry of the Reformed Churches, both Anglican and Nonconformist.

Groups of dissatisfied "seekers" were at that time meeting together, waiting for some authentic revelation from God; and this many of them believed that they received through the preaching of George Fox. He was at that time a young man of imperfect education, but of deep moral earnestness; and, in spite of some temporary extravagances, he showed remarkable sanity, clearness of moral vision, and organizing ability. He had passed through very deep spiritual experiences in his search for God, and believed that, when no help had come to him from men or books or churches, God at last had spoken to him directly, as to the ancient prophets.

Of those who were convinced by Fox, and who gathered as children of the light, a large number became preachers and travelled over the British Isles, parts of the Continent, and the American colonies. Some of the converts were men of learning, like Pennington, Penn, Ellwood, and Barclay. Their aim was not to form a new sect, but to bring the whole Christian Church back from "the dark night of apostasy" into the light of truth. They met with fierce persecution from the orthodox, who regarded their

views as subversive of both Church and Bible. During this period of persecution their numbers increased rapidly both in the U.K. and in America.

After the Toleration Act of 1689, persecution for the most part ceased, and a time of mystical quietism and decline set in. The evangelical revival of the 18th century hardly touched the Friends till near its close. Joseph John Gurney was the chief agent in bringing a new evangelical spirit into the society, which in the 19th century manifested itself in fresh interest in biblical study, in home and foreign missions, and in the spread of the adult school movement; but with some loss of the mystical element that was fundamental in early Quakerism. From about 1890 there was a drawing together of these elements, aided by the spread of a new desire for religious education and a widened intellectual outlook.

The Inward Light

All the distinctive views and practices of the Quakers flow from the root principle of the inward light—the belief that every man has, or may have, some direct experience of God in the soul. In public worship they discard all professional ministry and arranged services. They meet in silent fellowship and wait on God, giving freedom to any man or woman who is believed to be moved by the Spirit to preach or lead the company in vocal prayer. They do not practise the outward sacraments of Baptism and the Lord's Supper, believing that the whole emphasis of Jesus Christ and His apostles was not upon symbolic acts, but upon inward experience and rightness of life.

They have a unique form of marriage, in which human priesthood finds no place, the man and woman simply taking one another in the presence of God and the congregation. They refuse to take judicial oaths, believing that anyone who walks in the light will always and everywhere do his best to speak the truth. In church government every member, man or woman, has an equal voice. No question is decided by a vote; but after a time of silent worship matters are discussed in a reverent spirit, and the clerk or president gathers what he believes to be the sense of the meeting—his decision being very rarely challenged.

From the earliest days the conviction that the light of God is in some measure present in all men has given the Friends a special sense of human brotherhood, and has made them pioneers in philanthropy. The society was the first Christian body in the U.S.A. to forbid its members to hold slaves, and in England Friends, led by Elizabeth Fry, took the lead in prison reform, and also in the kindly treatment of the insane. The same spirit is at the root of their rejection of war, involving the double conviction, upheld by no other Christian body, (1) that war is always contrary to the spirit of Christ; and (2) that it is always unnecessary for a nation that will persistently act with justice to all. This twofold conviction was put into practice in Penn's "holy experiment"—the colony of Pennsylvania having been maintained under Quaker rule for more than 70 years without armed defence against Indian marauders, and without being attacked by them. During the First and Second Great Wars most Quakers refused military service, but did good work in organizing relief services and ambulance units for both home and overseas service. The Nobel peace prize for 1947 was awarded to the Friends Service Council (Great Britain) and the American Friends Service Council jointly.

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Socinus, FAUSTUS (1539-1604). Latinised form of the name of the Italian theologian, Fausto Sozzini. Born at Siena, Dec. 5, 1539, he was poorly educated, and after some wanderings in France and Switzerland, where he associated with members of the Reformed churches, entered the service of the daughter of the grand duke of Tuscany. Having studied theology for three years at Basel, he went in 1579 to Poland, where he vigorously promulgated his rationalistic and anti-Trinitarian views, especially at the synod of Brest-Litovsk in 1588. The publication of his book, On Jesus Christ the Servant, in 1598, provoked a riot in Cracow, in which he nearly lost his life. He died, March 3, 1604.

His uncle, Laelius Socinus (1525-62), also born at Siena, travelled through many parts of Europe, associating with the reformers and scholars of France, England, Germany, and Poland, and settled in Zürich, where he died, May 14, 1562. His rationalistic teaching was developed by his nephew, the real founder of the Socinians. This sect rejects all Christian doctrines that cannot, in its view, be based on human reason, particularly those concerning the Person of Christ. It spread in Poland, where it was suppressed in 1648, and survives in Transylvania, where it numbers about 60,000 adherents.

Sociology. Scientific study of human life in organized communities. In 1839 Auguste Comte coined the word to express the idea that the phenomena of social life are included within the unity of nature and are subject to inevitable natural laws. Sociology may be compared with biology: as biology aims at gathering into a single beam the lights thrown by anatomy, physiology, embryology, and natural history upon the process of individual life, so sociology seeks to bring together the results gained by workers in the several social sciences.

Man being essentially a social animal, the social sciences cover almost all phases of human activity and interest, e.g. economics, the comparative study of property, law and justice, crimino-

logy, and penology. All may, however, be grouped under three heads: (1) anthropology; (2) social psychology; (3) the study of social institutions.

Anthropology is, so to speak, the natural history of human societies. It includes ethnology, which becomes anthropology, in the proper sense, only when men are studied in their actual social groupings. A classical instance of this "descriptive sociology" is Spencer and Gillen's account of the central Australian tribes—which has inspired many valuable studies of the primitive peoples. In such studies the "functional" method, i.e. taking a view of all the features of a particular society as fitting together to form a working whole, came to be generally accepted. A general comparison of the customs, beliefs, and cultures of primitive peoples, such as E. B. Tylor made in his pioneer works, is a natural sequel to these studies of special communities, and leads inevitably to questions about the forces which determine change and progress among mankind. Here a notable difference of opinion and method has appeared. The older anthropologists assumed that resemblances in the customs and institutions found in different parts of the world were due to the similar reactions of the human mind to the same conditions. A later school maintained, on the contrary, that they are often, if not generally, due to the spread of culture from one people to another.

Social psychology seeks to discover in the individual human mind the forces which account for the origin and cohesion of social life. The old idea of Hobbes and his successors, that social life sprang from reasoned choice, has long been abandoned, to be replaced by conceptions based upon the obvious analogy between the social behaviour of men and of certain animals. Psycho-analytic and similar systems have contributed much to social psychology.

Among the special studies of social institutions, a chief place must be given to the discoveries about religion, magic, and folklore, which have thrown a flood of light, not only upon the workings of barbarian minds, but also upon the foundations of western civilization. Sir James Frazer's monumental works contributed substantially to this conception. E. A. Westermarck's comprehensive study of marriage is, perhaps, the best instance of minute

sociological inquiry into a single institution, while the works of the same author and Prof. Leonard T. Hobhouse on the evolution of moral ideas illustrate the application of sociological methods to wider questions. Literature and art have also been treated by such methods; indeed, every aspect of culture is now thought worthy of sociological examination.

It is maintained that exact knowledge upon the matters indicated is indispensable, if the future of a complicated society is to be intelligently guided, especially in an age of flux. Sir Patrick Geddes, following the French master, P. G. F. Le Play, advocated the sociological survey of cities and the regions from which they draw their life, so that the material and spiritual needs of the inhabitants may be better supplied and organized. It has also been urged that ignorance of comparative sociology has not infrequently led govts. having colonial responsibilities and their agents into costly mistakes in their dealings with undeveloped peoples, and anthropological advisers to colonial govts. are frequently appointed.

The Institute of Sociology is a British learned society founded in 1905 as the Sociological Society, to promote investigation and education in social science. It has published *The Sociological Review* since 1908. The headquarters (1948) are at Ledbury, Herefordshire. See Anthropology; Family; Kinship; Marriage; Society.

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Sock (Lat. *soccus*, slipper). Originally, the light shoe worn by actors in ancient Greek comedy. It was hence sometimes used as a symbol of comedy as distinct from tragedy, in which the actors wore buskins (*q.v.*). The name is now given to a knitted or woven covering for the foot, ankle, and part of the leg, or to a detachable inner sole to a shoe.

Socman. In old English law, person holding a tenure by socage. A socman was distinguished from one holding tenure by the rendering of sporadic military service by the fact that he rendered a specific and regular service, and he stood in a class superior to the villen; thus, petty serjeantry was a form

of socage tenure. Free, simple, or common socage implied that the socman rendered some service of an honourable nature, as commonly the acknowledgement of fealty and a fixed annual payment. Villein socage left the socman with a fixed and definite, but meaner, service for his tenure. From the free socmen of early times, the descent of the medieval yeoman class has been traced, and they became gradually merged in the freeholder class of tenants. See Copyhold; Freehold; Manor.

Socorro. Town of Colombia, in the dept. of Santander. It is 145 m. N.E. of Bogotá, and has woollen and straw plait industries. Founded in 1540, it was destroyed in 1681 and rebuilt on its present site. Pop. 10,000.



Socrates, the Greek philosopher
From a statuette in the British Museum

Socrates (c. 470-399 B.C.). Greek philosopher. Son of Sophroniscus and Phaenaretē, he was born about 470 B.C. and is said to have learnt the hereditary craft of a sculptor. He married Xanthippē, by whom he had three sons; according to Xenophon she was a shrew. Our knowledge of Socrates is almost wholly derived from the dialogues of Plato.

Assuming that, as recent criticism has rendered probable, the historical background of the dialogues is in the main accurate, the following narrative may be constructed. From his childhood Socrates was visited by experiences

which he described as the warnings of a "spiritual voice"; these were always prohibitions. He was also subject to trances. He also possessed exceptional powers of physical endurance, and could hold his own in drinking bouts, although "no man ever saw Socrates drunk." He was thickset and ugly in countenance, with a snub nose and prominent, piercing eyes; his portrait is preserved in many busts.

From his youth up Socrates was keenly interested in the religious, philosophical, and scientific movements of his time. Physical science was then represented partly by the Ionic school of inquiry, which devoted itself mainly to the search for the "primary substance" underlying the diversity of phenomena, and partly by certain Western schools, especially that of the Pythagoreans. Socrates seems to have been specially interested in the theories of Diogenes of Apollonia, who held that air, in various degrees of condensation, formed the substratum of the material world, and he also shows acquaintance, in the *Phaedo*, with the doctrines of Empedocles.

The Theory of "Forms"

The result was that he framed the theory of "forms." According to this theory the world of sense is related to that of thought by the participation of things in the "forms" or patterns which alone are permanent. This theory, perhaps of Pythagorean origin, was developed by Socrates, both in its logical aspect and also as the key to morals, since, for example, just or courageous actions were viewed as becoming such by participation in the "forms" of justice and courage. But Socrates owed more to the Pythagoreans. His mystical nature was attracted by the doctrine of the soul as a divine, immortal spark, imprisoned in the body and released at death.

Socrates rapidly became a man of note in Athenian society. About 435 B.C. his friends Chaerephon asked the Delphic oracle whether any man was wiser than he, and received a negative answer. Socrates interpreted this to mean that he alone was conscious of his own ignorance, and that his mission was to convince others of the same truth about themselves; and this mission he pursued until the close of his life, seeking opportunities of discussion, especially with the young, and exposing the inner contradiction of popular ideas, particularly in morals and politics, by the method of question and answer. In 432 B.C. the war with

Sparta broke out, in which Socrates served with distinction.

In 423 B.C. Aristophanes produced his comedy of the Clouds, in which Socrates is caricatured. The "thinking-shop" (*phrontisterion*), with its "souls," who are also students of "things in the air and below the earth," suggests a Socrates who is the head of a community like those of the Pythagoreans, but the instruction given in the art of "making the worse appear the better reason" is a shaft aimed at the Sophists, amongst whom it is not fair to class Socrates. From the dialogues of Plato we are led to picture him rather as the centre of a coterie of youths belonging to the best Athenian families, notably Alcibiades and the uncles of Plato, Glaucon and Adeimantus, who are represented as regarding him with affectionate admiration. The assumed date of the Symposium of Plato, in which Alcibiades gives a vivid account of his relations with Socrates, is 416 B.C., and Aristophanes appears to be on friendly terms with him.

In 399 B.C., after the restoration of democracy, he was prosecuted for corrupting youth, and introducing new divinities in place of those recognized by the state. The real ground of the prosecution was doubtless political; Socrates was held responsible for the anti-democratic careers of such men as Alcibiades and Critias, who had been members of his circle. The death penalty was only voted by 280 to 220. A month later he drank the hemlock in prison, having refused the offers of his friends to contrive his escape. His last hours were spent in discussing the immortality of the soul with a group of disciples; their conversation is recorded by Plato, one of the younger members of the school, in the *Phaedo*.

The importance of Socrates' philosophy was capital, both in logic, through the theory of "forms" which implies that thought deals with universals, and in morals: his famous doctrine that "Virtue is knowledge and vice ignorance," rightly understood, means that true goodness can only be based on a full realization of the nature and faculties of the soul of man. From this flow all specific virtues, e.g. the brave man is he who "knows what ought and ought not to be feared." See Greece; Philosophy; Plato. *Pron.* Sockra-teez.

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Soda. Popular name for sodium carbonate or washing soda, also known as soda-ash. In such expressions as baking soda, sodium bicarbonate is meant, which is more suitable for use in baking powder on account of the larger yield of carbonic acid gas which it gives on contact with acid.

Soda Lake. Name given to the natural sink in which the drainings of alkali plains have collected. They are in reality lakes with no outlet, and form the most important sources of soda. Three of the most famous of these lakes are Albert Lake, Mono Lake, and Owens Lake, all in the U.S.A.

Sodalite. In mineralogy, one of the feldspathoid group. A complex sodium aluminium silicate with sodium chloride, it occurs in blue isometric crystals or grains in soda-rich igneous rocks low in silica, e.g. nepheline-syenite.

Soda Water. Aerated water charged with carbonic acid gas. The gas is forced into the water under pressure, and the liquid mechanically bottled and stoppered. Soda water is used generally with other liquids, e.g. whisky, or milk. Soda water was first manufactured commercially in Geneva at the end of the 18th century, and introduced into England by Schweppe. In a soda fountain, soda water is contained in a marble or metal vessel supplied with valves and pipes by which the contents can be drawn off. See Aerated Waters.

Soddu, UBALDO (b. 1884). Italian soldier. This Neapolitan was commissioned in the Italian cavalry in 1904 and served in the First Great War. He commanded a motorised brigade in the Italian invasion of Abyssinia, and a military station near Addis Ababa was named after him. In 1939 he was appointed under-secretary for war and in 1940 vice-chief of staff to Gen. Graziani. Soddu was commander-in-chief of Italian forces in Albania, but after his defeat by the Greeks in Dec., 1940, he was relieved of his command and retired in disgrace.

Soddy, FREDERICK (b. 1877). British scientist and monetary theorist. Born at Eastbourne, Sept. 2, 1877, he was acting as Rutherford's chemical assistant at Montreal, 1900-02, and as co-worker with Ramsay at Uni-

versity College, London, 1902-04. He lectured on radio-activity and physical chemistry at Glasgow university, 1904-14, then became professor of chemistry at Aberdeen until 1919, when he was made Lee's professor of chemistry at Oxford, retaining that chair until his retirement in 1936. An authority on radium and radio-activity, he discovered and worked out the theory of isotopes, 1912, and, with Rutherford, originated the theory of atomic disintegration and the displacement law of radio-activity, receiving the Nobel prize for chemistry in 1921. His many publications were mostly concerned with the branch of science he had made his own, e.g. Radio-activity, 1904; Interpretation of the Atom, 1932. But in later years he became interested in the problem of money, and formulated a theory of virtual wealth, which he expounded in *Wealth, Virtual Wealth, and Debt*, 1926; *Money versus Man*, 1931; *The Role of Money*, 1934.



Frederick Soddy,
British scientist

Söderblom, LARS OLOF JONATHAN (1866-1931). Swedish theologian. Born at Trönö, Jan. 15, 1866, and educated at Hudiksvall and Uppsala university, he was pastor of the Swedish Church in Paris, 1894-1901. Professor of theology at his old university during 1901-14, he also held the chair of comparative theology at Leipzig, 1912-14. He was then appointed archbishop of Uppsala and pro-chancellor of the university, in which offices he continued till his death, July 12, 1931. The author of many books on religion, the best known being *The Nature of Revelation*, he became a member of the Swedish academy in 1921. This leader in the movement for the unification of churches helped to prepare for the universal Christian conferences on life and work, held at Stockholm in 1925 and at Lausanne in 1927. Nathan Söderblom was awarded the Nobel peace prize in 1930.

Söderhamn. Seaport of Sweden. It is 135 m. in a direct line N. by W. of Stockholm on an arm of the Gulf of Bothnia, and is connected by a branch line with the main rly. from Stockholm. Wood pulp, timber, and iron goods are exported from it and its outport, Stugsund, 3 m. S.E. Pop. 11,600.

Södermanland. Län or co. of Sweden. It lies between Lake Malar and the Baltic Sea, and has an indented coastline. Iron is mined at Kantorp, copper at Tunaberg. Nyköping is the capital. Area, 2,634 sq. m. Pop. 204,727.

Södertelje. Town of Sweden. Situated at the S. end of Lake Malar, it forms a residential suburb 15 m. S.W. of Stockholm, with which it has connexion by rly. and steamer. It is on the Södertelje Canal, which joins Lake Mälaren to the Baltic Sea. Pop. 22,080.

Sodium. One of the metallic elements. Its chemical symbol is Na, atomic number 11, atomic weight 22.99. It was first distinguished from potassium, its neighbour in the periodic table, by Duhamel in 1736, and both elements were first separated in the metallic state by Davy in 1807. Sodium metal is still manufactured by Davy's process, *i.e.* by passing electricity through fused caustic soda in an iron vessel kept hot by a suitable furnace. Sodium and hydrogen are separated at the cathode, and oxygen at the anode. The former may also be prepared by electrolysis of a salt solution, arrangements being made for the sodium deposit to be prevented from combining with the water.

In the pure state, sodium has a silver white lustre, and exhibits most of the properties characteristic of metals generally, but it differs from the better known metals in being extremely soft, lighter than water (sp. gr. .9724), in melting very easily (at 97° C.), and especially in reacting violently with water to form caustic soda, hydrogen being released and then bursting into flame from the heat of the reaction.

Sodium unites with mercury to produce sodium amalgam, and with potassium metal to form an alloy which is liquid at 0° C., and is used for filling special thermometers to measure temps. higher than the boiling point of mercury. When sodium metal is heated in dry air it produces sodium oxide, Na_2O , and sodium peroxide, Na_2O_2 , the latter a strong oxidising agent.

Most sodium compounds are colourless and readily soluble in water. They impart a yellow colour to a non-luminous air-gas flame when a trace of the substance is introduced on a wire into the flame, and this yellow light is used frequently as a monochromatic light. (*See* Sodium Lamp.) In nature, sodium is never found in the metallic state, but in the

form of various compounds, *e.g.* sodium chloride, or common salt, either as rock salt or dissolved in sea water; sodium nitrate in the form of Chile saltpetre; sodium sulphate in the mineral glauberite, etc.

The chief compound of sodium is the chloride, NaCl , or common salt. This may be produced by the direct union of its elements, sodium and chlorine, or by neutralising caustic soda, or washing soda (sodium carbonate) with hydrochloric acid. It is soluble in water, and mixed with ice or snow it forms a good freezing mixture. It is insoluble in alcohol, melts at a red heat, and is used in the manufacture of washing soda, and of hydrochloric acid. It is a necessary adjunct to the diet of man, and is obtained from deposits of rock salt, as in Cheshire, or by distillation of sea water, as at Aden. (*See* Salt.)

Sodium bromide, NaBr , and sodium iodide, NaI , are respectively more soluble and less well crystallised than potassium bromide and iodide. In medicine they have the advantage of not being so depressing as the latter.

Caustic Soda Production

Sodium hydroxide, NaOH , or caustic soda, is manufactured by two processes. One is by boiling together slaked lime and sodium carbonate, whereby a solution of caustic soda is produced and a deposit of chalk formed. The solution is poured off, and evaporated until solid caustic soda remains. It may be melted and moulded into sticks. The other is by the electrolysis of a solution of sodium chloride; solution of caustic soda is produced at the cathode, and free chlorine, which is applied chiefly to the manufacture of bleaching powder, is evolved at the anode. Caustic soda is a white opaque brittle solid, rather more than twice as heavy as water, in which it is very soluble, forming a highly caustic solution, capable of destroying most animal and vegetable materials. The solution combines with oils and fats to form soap, in the manufacture of which caustic soda is chiefly used. It is also soluble in alcohol and in glycerine.

Sodium carbonate, or washing soda, is manufactured by the Leblanc and the ammonia-soda processes, and is one of the chief products of the alkali industry.

Sodium bicarbonate, NaHCO_3 , is used in medicine, in the manufacture of baking powders, seidlitz powders, etc. When more strongly heated, it leaves anhydrous sodium carbonate. It is

made by saturating a strong solution of sodium carbonate with carbon dioxide, when it is deposited as minute crystals, which require twelve times their weight of water to dissolve them. It is also obtained directly in the ammonia-soda process.

Sodium sulphate, $\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$, or Glauber's salt, is made as follows. In the Leblanc process of soda manufacture anhydrous sodium sulphate, Na_2SO_4 , in the form of salt cake, is obtained. This, on dissolving in water and crystallising, yields clear colourless crystals of Glauber's salt. A good cheap freezing mixture can be made by adding half a pound of common hydrochloric acid to one pound of the crystals. The anhydrous salt on heating with sulphuric acid produces sodium bisulphate, NaHSO_4 .

A solution of sodium carbonate on neutralisation with sulphur dioxide and concentration yields sodium sulphite in the form of clear colourless crystals. If the solution be saturated with sulphur dioxide, sodium bisulphite, NaHSO_3 , is obtained in solution. Both are used chiefly as antichlores, for staying the action of chlorine bleaching agents in the paper and textile industries. The bisulphite is also a useful preservative for certain foods. Sodium thiosulphate, $\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$ is popularly known as sodium hyposulphite and as hypo. The clear colourless crystals are one of the products of the alkali industry. They dissolve in three-fifths their weight of water, and are used in bleaching as an antichlore.

Uses of Sodium Salts

Sodium salts have extensive uses in photography. the thiosulphate as a universal fixer, carbonate as the most usual accelerator, sulphite as a preservative. Broadly speaking, they have a similar effect to the corresponding salts of potassium, and in some work are interchangeable, with appropriate modifications as to quantity.

Sodium silicate is obtained in several forms of various composition. It is produced by fusing together sand with about half its weight of sodium carbonate and a little charcoal. It is known as soluble glass, and the thick syrupy concentrated solution is known as water glass. It has many applications, *e.g.* preserving eggs, fireproofing wood and fabrics, manufacturing artificial stones, making cements, etc. *See* Alkali; Saltpetre.

Sodium Lamp. Lamp which makes use of an electric discharge through sodium vapour contained within a tube made of a glass resistant to sodium vapour. The tube is in the form of a U and contains, in addition to metallic sodium, neon at a low pressure. The discharge is started up through the inert gas. This gradually heats the tube and causes the sodium to vaporise. The luminous efficiency of such lamps, which have a characteristic yellow glow, reaches as much as 70 lumens per watt.

Sodom. City of Palestine, in the neighbourhood of the Dead Sea. One of the so-called cities of the plain, it is associated with Gomorrah as a place of unusual wickedness. Near here Lot made his dwelling. After he had been warned to leave, the cities were destroyed by fire and brimstone (Gen. 19). The exact site of the cities is unknown. Their destruc-

Soest. Old town of W. Germany, in N. Rhine-Westphalia. Situated 28 m. E. of Dortmund, in the centre of a rich agricultural area, it was famous in the 15th century for its school of painting. It was an independent member of the Hanseatic league and, with its urban legal code, originator in 1120 of all German local govt. law. From 1444 allied with the Brandenburg dynasty, Soest fell to Prussia in 1815. Its cathedral of S. Patroclus (10th-13th cent.), with fine mural paintings, and its Gothic S. Mary of the Meadow (14th-15th cent.) were in the main spared from otherwise severe damage in the Second Great War. There are several other 12th to 13th cent. churches, walls, and towers, and fine medieval dwellings. Soest is an important rly. junction, educational centre, and seat of iron, electrical, and shoe industries. It was captured on April 7, 1945, by the U.S. 9th army in the operations to conquer the Ruhr basin, and after the war came within the British zone of occupation. Pop. 27,500.

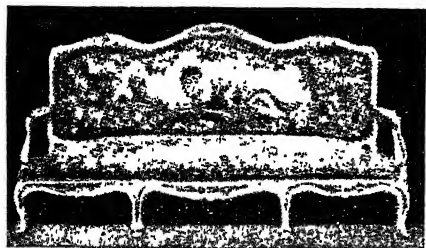
Sofa (Arab. *suffah*, bench). Article of furniture. In the East, where they originated, sofas were merely mattresses or thick carpets and cushions, or low platforms provided with cushions. They were introduced into England about 1700, and Cowper wrote of them in 1784. They were then low couches with several cushions, differing from the settee, which was an upholstered settle. But later the term sofa was used with less discrimination to cover both the couch and the settee, or any similar piece.

Sofala. Name of a prov. (with Manica), town, bay, and river of

Mozambique. The prov. was acquired from the chartered Mozambique Company in July, 1942. The small and decayed port of Sofala, with the scanty remains of the great fortress of San Caetano, lies some 25 m. S.W. of Beira. Long before the Portuguese occupation in 1505, Arabs carried on a great trade at Sofala in ivory and gold; it was the chief outlet for the gold mines of Manicaland and Mashonaland.

Soffit or **INTRADOS.** In architecture, term for the under surface of a structure such as an arch, a cornice, a vault, or a stairway.

Sofia or **SOPHIA.** Capital of Bulgaria, the ancient Serdica or Sardica. Situated on a plain at the foot of the Rhodope Mts., within a basin traversed by the river Isker, it is an important station on the Orient Express route and is distant by rail 407 m. N.W. of Istanbul, 100 m. S.E. of Nish, and 284 m. S.W. of Bukarest. Although much improved and modernised, it has few striking features; the chief buildings are the former royal palace, government buildings, the old cathedral of S. Nedelia (damaged by an anarchist bomb outrage 1925), the cathedral of S. Alexander Nevski (completed 1924), and the university. Sofia exports maize, silk, linen, cloth and hides. It is



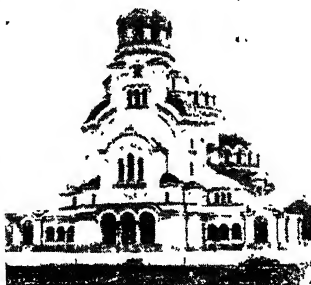
Sofa. Carved and gilt example of Louis XV period, covered with old Gobelin tapestry

tion has been explained as a volcanic eruption and as a conflagration of the local bitumen ignited by lightning. See Dead Sea.

Sodoma, IL. Sobriquet of the Italian painter Giovanni Antonio Bazzi (q.v.).

Sodor and Man. Name of a diocese of the Church of England, now confined to the Isle of Man. The diocese of Sodor (Old Norse *Sudreyjar*, Southern Islands, i.e. Hebrides) was formed in 1154, and comprised the Isle of Man and numerous islands off the W. coast of Scotland, then belonging to Norway. After Norway lost her Scottish possessions in 1266, the name Sodor was retained for the diocese, which in 1334 was limited to Man, the cathedral being on St. Patrick's Isle near Peel. In the 17th cent. the words "and Man" were erroneously added. For some purposes the diocese is in the province of York. The bishop does not sit in the house of lords.

Soekarno or **SUKARNO.** AHMED. Indonesian statesman. See Sukarno in N.V.



Sofia, Bulgaria. General view showing Parliament House Square with the statue of the Tsar liberator, Alexander II. Top, cathedral of S. Alexander

the seat of a Greek metropolitan. Taken by the Turks in 1382, it remained in their hands till 1878, when the Russians occupied it, and it became the capital of Bulgaria.

In the Second Great War Sofia was an important communication centre for Axis forces in the Balkans and was frequently bombed by Allied aircraft. The city was captured by Russian armies under Gen. Tolbukhin on Sept. 15, 1944. Pop. est. 401,300.

Softening of the Brain. Popular term applied to conditions in which degeneration of the brain tissue occurs, as in general paralysis of the insane or cerebral thrombosis or embolism. See Brain; Mental Disorder.

Soft Grass (*Holcus*). Small genus of grasses of the family Gramineae. They are natives of



Soft Grass. Flower panicles and leaves of Yorkshire Fog, a downy meadow grass

Europe, temperate Asia, and Africa. *Holcus lanatus*, known in Great Britain as Yorkshire Fog, is a tufted, downy, perennial meadowgrass, with leafy stems and flat, soft leaves. The flower panicle is somewhat open, and the spikelets two-flowered.

Holcus mollis has a creeping rootstock, and the plant is more slender. It grows in woods and waste places. The grass is of little economic value.

Softwoods. Term for the timber of various trees in which the wood is soft by comparison with that of the hardwoods. The distinction is loose, and some of the so-called hardwoods are comparatively "soft." Softwoods are used for building construction and similar work; they include timber from conifers such as pines, firs, hemlock, spruce, larch, as well as cedars. See Hardwood; Timber.

Sogdiana. Ancient division of Asia, now part of Soviet Central Asia, mostly in Uzbek S.S.R. The Jaxartes separated it from Scythia, the Oxus from Bactria. It was conquered by the Persians in the time of Cyrus, was invaded by Alexander the Great, and, later, came into the hands of the Seleucid dynasty.

Sogne Fjord. Longest of the Norwegian fjords. On the W. coast, it stretches inland 112 m., and has branch fjords such as the Lyster and Naero fjords. The walls rise sometimes to 5,000 ft.

Sogn-og-Fjordane. Fylke or co. of Norway, formerly called North Bergenhus. Bounded W. by the Atlantic and E. by Opland and Buskerud, it is penetrated by the Sogne Fjord. Area, 7,135 sq. m. Pop. 95,869.

Soham. Town of Cambridgeshire, England. It is 6 m. S.E. of Ely, with a rly. station. The chief building is S. Andrew's church, a cruciform building with several beautiful features. Dating in part from the 12th century, it has a Perpendicular tower. The grammar school was founded in 1687. In 630 a monastery was founded, but was destroyed in 890 by the Danes. Soham is the centre of a fruit-growing dist. Soham mere, now drained, was one of the large sheets of water in the fens. Pop. 5,000.

Soho. District of W. London. It lies within the area bounded by Oxford Street, Charing Cross Road, Shaftesbury Avenue, and Regent Street, and also in the S.W. corner of Tottenham Court Road. Dating from the first half of the 17th century, it was once part of the parish of St. Martin-in-the-Fields, is notable for its literary, artistic, and musical associations, foreign colony, foreign restaurants, and is the centre of the film trade in London. Soho Square, built 1681, was once a fashionable, and is now largely a commercial, centre. It contains a hospital for women, St. Patrick's R.C. church, 1893, and a French Protestant church, 1893. S. Anne's, in Wardour Street, founded 1685, with a curious tower dating from about 1802, was renovated 1896-97, and virtually destroyed in a German air raid, 1941; in the churchyard, now a recreation ground, are monuments to Hazlitt, and Theodore, king of Corsica. Consult *The Romance of Soho*, E. B. Chancellor, 1931; *Soho Square*, M. Goldsmith, 1947.



Sogne Fjord, Norway. View of this beautiful fjord near the branching Naero Fjord

Soho. Name of a ward, hill, public park, and rly. station of N.W. Birmingham. Another rly. station is Soho and Winson Green. Here was the foundry of Boulton and Watt, where gas was first used as an illuminant by Murdock in 1802-03.

Soignies. Town of Belgium. In the prov. of Hainault, it lies on the Senne, 22 m. by rly. S.W. of Brussels, and is a junction on the Brussels-Mons line. The main industry is quarrying blue limestone, and there is local agricultural commerce. The abbey church of S. Vincent, a 7th century monastic foundation, is a noteworthy example of early Romanesque work, and there is a 17th century town hall. In the woods to the S. of the town British and German cavalry first came into conflict in Aug., 1914. Pop. 11,000.

Soil. The surface layer of earth in which plants grow. It is more correctly called the soil mantle. It consists of (a) mineral matter derived from the rocks of the earth's crust (see Geology); (b) organic matter (humus) dark in colour and resulting from the decay of plant and animal material; (c) water (rainwater moving downwards and ground water often drawn upwards through the soil by evaporation from the surface in warm weather); and (d) air held in pores and crevices and passing down through cracks and other spaces between soil particles. The mineral part of the soil is derived from the materials of the crust either by direct incorporation when those materials are soft or unconsolidated (e.g. clays, sands), or after weathering when the rocks are hard (e.g. granite, limestone, sandstone), as a result of the action of natural agents such as air, seeping waters, and by plants, animals (including earthworms and insects), and by bacteria and substances produced by the life processes of living things.

The soil mantle thus contains and supplies the food (other than that derived from the air) plants need. The food is taken through roots from soil moisture, especially that clinging to the minute constituent particles of the soil and containing nutrients in solution. The soil mantle consists of a vast number of individual soils known to farmers and scientists. The differences between them are due to such factors as differences of climate, vegetation, geological nature and origin of mineral constituents, natural drainage, topography, colour, acidity or alkalin-

ity, texture, depth, and presence or absence of stones. By these factors, many of them interrelated, all soils are classified, first as they are known to the practical farmer on his own land and then by grouping according to recognizable zonal properties which may be valid over large areas on a continental scale (e.g. Tundra soils, Podzols of northern Europe, Chernozems or black soils of the European wheat-belt, Chestnut soils, Arid soils). Thus a farmer in England may distinguish individual soils of his farm by their sandy or clayey nature, their rapid or slow drying after rain, their steepness on hillsides or flatness in the plain, their dark or light colour, their acidity or alkalinity, their ease or difficulty in ploughing, their shallowness or depth, or their pebble-content, while the soil scientist may find large numbers of such individual soils with common characteristics imposed mainly by climate. Thus most of the soils of Great Britain show an upper foot or two depleted of colouring matter (mainly sesquioxide of iron) by seepage of rainwater rendered faintly acid by decaying vegetation. Much of this colouring matter is redeposited deeper down, and is frequently reddish brown. Such redistribution produces a horizonation, the appearance of which in a pit or other excavation is called the soil-profile. In addition to iron compounds, clay and humus are among other substances carried down and redeposited. When the processes are unrestrained (as in sandy materials) a horizon not far below the surface (about 8 ins. and downwards) becomes ashy-grey. Such a soil is called a podzol (Russian, ashy soil) and the process is podzolisation. The podzol zone includes the British Isles and runs east and west across Europe and Asia in a belt about 900 miles wide. Podzolisation depends upon downward displacement by water, and the presence of acid conditions (due to decaying plant debris) in the surface soil. These two conditions may be absent in the podzol zone and another (intrazonal) soil may occur, e.g. where limestone occurs in the surface soil all acids are neutralised, and podzolisation cannot take place; water-logging likewise inhibits podzol production.

The texture of a soil (upon which ease or difficulty of working depends) is determined by the proportions of sand, which is gritty, with particles visible to the naked eye; silt, smooth and not sticky with particles too small to be de-

tected by the unaided eye; and clay, which is sticky and plastic. When sand is dominant the soil is light; when clay and silt are dominant it is heavy. When sand, silt, and clay are evenly balanced so that the soil is neither gritty, entirely smooth, nor sticky it is called a loam. Frequently loams owe their composition to the mixing action of rivers which gather geological materials from the different rocks in their course. Thus soils in valleys, and especially on river terraces and hillsides where rivers formerly worked, are often loams which have been elevated by earth movement, and some of these are among the best soils, especially when well but not excessively drained. The suitability of soils for different crops is a complex matter, depending upon the natural characteristics which have been mentioned.

Well-drained soils of dark colour are warmest, especially those (in the northern hemisphere) facing south, but hollows which hold cold air at nights in spring (frost-pockets) are to be avoided for fruit crops liable to blossom damage.

Manures can be added to soils; so can lime when it is needed; but most of the natural properties of the soil cannot be changed on a farm scale. The selection of good soils is therefore important.

See Agriculture; Crops; Farm; Gardening; Manure; Rothamsted. Consult Physical Properties of Soils, R. Warrington, 1900; The Soil, A. D. Hall, 1903; Farm Soil and Its Improvement, Sir E. J. Russell, 1923; Good Soil, S. G. Brade-Birks, 1947.

S. G. Brade-Birks, D.Sc

Soil Erosion. Man-made denudation of the soil (average depth only 10 ins.) is of widespread occurrence and great antiquity. In modern times it affects particularly the continents of N. America and Africa, where excessive cultivation has removed the covering of grass and the cohesive influence of tree and bush roots and exposed the loose topsoil to wind and water; winds, rain, and streams wear this away, leaving bare rock exposed. The taking of too many crops of the same kind without proper rotation; failure to replace humus by the use of natural manures; tractor instead of horse ploughing; excessive grazing of native-owned cattle within tribal boundaries, are some of the causes of this grave problem which, in view of the increasing total population, threatens a world food shortage.

Soil Creep. Slow movements of the particles of soil down sloping surfaces. Gradual loosening of upper layers of soil is caused by weathering, and gravity aids in bringing loosened material from higher to lower levels.

Soissons. Town of France, in Aisne dept. It stands on the Aisne, 65 m. N.E. of Paris. The



Soissons arms

Romanesque-Gothic cathedral, composite in style, was founded in the 12th century. The great castellated abbey of S. Jean des Vignes is in ruins, the old abbey of Notre Dame is now a barracks, that of S. Léger an educational institution. The trade is mostly agricultural. Pop. 18,174.

Soissons is one of the oldest cities in France, and was the seat of the powerful tribe of the Suessones. Here, Clovis defeated Syagrius in 486, and ended Roman rule in France by establishing the kingdom of the Franks. The fortified key to the capital against invaders from the N., Soissons has suffered incessantly from warfare. Sacked by the Huguenots in 1567, in the war of 1814 it was twice taken and retaken by the allies; in 1870 the Germans took it.

In the First Great War it was occupied by the 1st British corps during the retreat from Mons in 1914. The Germans held it for a short time, but were driven out on Sept. 12, after which they bombarded it, ruining the cathedral and most of the buildings. On Dec. 28 a small force of French troops attacked the German front N. of Soissons with liquid air bombs, of which much was hoped; but these proved a failure. The Germans came back at the end of May, 1918, but were finally driven out by the French on Aug. 2. To rebuild the town, in 1922 a group of Canadian banks lent over £1,000,000 to the municipality. In 1928 a memorial to missing soldiers was unveiled at Soissons. The restored cathedral was reconsecrated in 1937.

In the Second Great War the town was entered by German troops June 9, 1940, and lay in the German occupied zone until liberated, Aug. 29, 1944, by units of the U.S. 1st army, who met with no opposition from the German rearguards. See Aisne Battles; Marne Battles.

Soke. Originally the right to hold a court of law. The land

subject to such jurisdiction was known as sokeland, and the men whose duty it was to attend the courts as sokemen or socmen. Later the word was used for the district under such jurisdiction, and, although its use disappeared with the end of the manorial system, it survives as a name in the soke of Peterborough (*q.v.*). See Manor; Socage.

Sokol (Czech, falcon). Czech patriotic and gymnastic organization. It was established in 1862 by Miroslav Tyrsh (1832-84) and Jiudrich Fügner (1822-65), and was democratic and fraternal. The movement spread rapidly, and Sokol unions were formed everywhere throughout Bohemia, including, after some years, special organizations for women. Though frowned on by the Austrian authorities and from time to time suppressed, the Sokols came to represent more and more the intense national spirit of the Czech people, especially of Czech youth. At the congress of 1920, held at Prague, one item was a mass drill by 12,000 men, and another a similar display by 12,000 women, participants coming from all over the world. Under the Communist regime set up in 1948 membership of the Sokol was made compulsory and attempts were made to change it into a Communist party institution. The special dress is a loose fawn jacket, often worn hussar-wise over a red shirt, and a round fawn cap bearing a Sokol feather. See Czechoslovakia illus. p. 2539.

Sokolovsky, VASILII DANLOVICH (b. 1899). Russian soldier. Son of a Georgian peasant, he joined the Red Army as a private in 1919 and saw active service in the Russo-Polish war, being commissioned in 1922. He achieved prominence in the Second Great



V. Sokolovsky,
Russian soldier

War as commander of the Soviet forces which recaptured Vyazma from the Germans on March 12, 1943. Appointed to a command in the 1st Ukrainian army under Marshal Konev (to whom he became chief of staff in Jan. 1945), he led the troops which liberated S. Poland, taking Kielce Jan. 15, Cracow Jan. 19, 1945, and advanced through German Silesia to cross the Oder in March. In 1946 Sokolovsky was promoted marshal

and made c.-in-c. of Soviet occupying forces in Germany and Soviet member of the Allied control council in Berlin. In that capacity he enforced in 1948 a blockade of the Western powers' sectors in Berlin. In 1949 he was appointed first deputy minister of the armed forces of the U.S.S.R. He was created hon. K.B.E. in 1945.

Sokoto. Prov. and city of N. Nigeria. The province has been administered as a native state of Nigeria since 1903. Its history is of considerable antiquity. Under Moorish, Berber, and Arab influences the Hausa embraced Mahomedanism, and developed large cities and a considerable trade. Prior to the establishment of the Fula power in the early part of the 19th century the country, as a whole, was subject to various rulers. Under the Fula regime the sultan of Sokoto exercised control over the Hausa states, his overlordship extending to Bornu on the E., and S. to the Benue, and even at one time to Adamawa. The states within this kingdom were known variously as the Sokoto or Fula empire, and are generally alluded to as Hausaland.

The city of Sokoto was visited by Clapperton in 1823 and 1827, and by Barth in 1851-55. From 1901 the submission and annexation by the British of Yola, Bornu, Kano, and Katsena took place, and Sokoto was occupied on March 22, 1903.

Sokoto prov. consists of the Gando, Argungu, and Ilo divisions, as well as Sokoto proper. It is bounded N. by the French Niger territories, W. by Dahomé, E. and S. by other northern provs. of Nigeria. The chief river is the Gublin Kebbi, or Sokoto, which flows into the Niger. Area, 35,400 sq. m. Pop. approx. 1,300,000. A portion of the former independent sultanate lies within French territory.

Sokotra or **SOCOTRA**. Island of the Indian Ocean. It has been a British protectorate by agreement with the sultan of Keshin since 1876, and is administered from Aden. Situated 135 m. E.N.E. of Cape Guardafui, the horn of Africa, in the Arabian Sea at the entrance to the Gulf of Aden, it measures 72 m. by 22 m., and rises in the middle to the Haghier Range, 4,600 ft., with well-watered valleys densely clothed in vegetation, which yields frankincense and myrrh. Tamarida, the capital, is on the N. coast. Butter (ghee), aloes, and incense are exported; goats and cows are

reared in large numbers. The Mahomedan population of mixed Arab and Hindu origin lives on the coasts, the Sokotri among the mountains. Area 1,382 sq. m. Pop. 12,000. See Africa, map.

Sol. Peruvian currency unit, nominally of gold, equivalent to one-tenth of the obsolete Peruvian libra, or pound. It is divided into 100 centavos, and was until 1935 coined in silver pieces, but since then has been in paper form.

Sol. Term used to indicate a colloidal solution. Where the dispersion medium is water the solution is called a hydrosol. See Colloid.

Solanaceae. Large and important family of shrubs, herbs, and a few trees. With narcotic or tonic properties, they are natives chiefly of the warmer regions. The family includes such valuable plants as the potato (*Solanum tuberosum*), the tomato (*S. lycopersicum*), chillies (*Capicum*), tobacco (*Nicotiana* species), belladonna (*Atropa belladonna*), and henbane (*Hyoscyamus niger*).

Solano (Span., from Lat. *solanus*, easterly). Cloudy, rain-bearing E. wind experienced in E. Spain. It is probably an ordinary eddy in the main air currents of the South Westerlies, not to be confused with the leveche (*q.v.*).

Solar Constant. Unit value of the sun's energy radiation. It is the theoretical amount of energy which a square centimetre of the earth's surface would receive per minute if exposed perpendicularly to the sun's rays. An assumption is made that no heat is absorbed by the atmosphere. According to observations continued over a long period and in both hemispheres by C. G. Abbot of the Smithsonian astrophysical observatory, this unit of radiation is subject to long-period and short-period variations. In the last recorded results the fluctuations ranged over about 2 p.c. between the extreme limits of 1.91 calories per square centimetre per minute to 1.95 calories. Measurements of the sun's heat are made by a bolometer (*q.v.*).

Solar Cycle. In the Julian calendar, a period for finding the particular day of the week corresponding to a given day of the year. The period is one of 28 years. It enables the dominical letter (*q.v.*) of the year to be found. See Calendar.

Solarimeter. Instrument, designed by L. Gorczynski, for determining the intensity of solar radiation. It consists of a sensitive thermopile of low thermal

capacity and resistance, connected to a millivoltmeter or milliammeter; when a continuous record is obtained, the combination is known as a solariograph. Solarimeters can determine the intensity of the radiation from the sun and/or the sky falling upon a horizontal surface. If records of the sun radiation on a surface perpendicular to the solar beam are required, the thermopile must be mounted on a suitable clockwork or electrically driven heliostat. See Bolometer.

Solario, ANDREA (c. 1460–c. 1530). Italian painter of the Lombard school. Born at Milan, he probably studied there. In 1490 he accompanied his brother Cristoforo, a sculptor, known as Gobbo, to Venice, and Venetian as well as Lombard and Flemish influence is visible in his work. About 1507 he went to France to decorate the Château Gaillon for the Cardinal d'Amboise. He died at Pavia. There are many paintings by him at Milan, and two portraits in the National Gallery, London.

Solar Myth. In mythology, the personification of the sun. Thus the twelve labours of Hercules (*q.v.*) have been explained by mythologists as an allegorical representation of the sun passing through the twelve signs of the zodiac. See Mythology.

Solar Plexus. Network of nerves situated in the abdomen behind the stomach. It surrounds the coeliac axis, the thick, short artery which is a branch of the aorta. The solar plexus contains several ganglia or collections of nerve cells, and from it nerve filaments go to all the abdominal viscera. A blow on the pit of the stomach is the so-called solar plexus blow in boxing, and temporarily paralyses the sensitive network of nerves.

Solar System. Assemblage of bodies controlled by the attraction of the sun. It includes the planets and their satellites, asteroids, comets, and meteor swarms. The planets are all separately described in this work, as are other members of the system. The span of the solar system, counting Pluto as its farthest limit, is over 7,000 million miles, though comets go out beyond Pluto. On a scale giving Pluto's orbit a radius of one mile, the nearest star would be 6,900 miles away. The distances separating the planets conform to a rough empirical law known as Bode's law (*q.v.*). All the planets move round the sun in the same direction, as do the asteroids and

the majority of the satellites. Comets move in either direction round the sun. The origin of the solar system has been accounted for by the nebular hypothesis (*q.v.*) or by various tidal theories; but no explanation yet put forward is generally accepted. See Planet; Sun.

Solar Time. Time as measured by the diurnal motion of the true sun (apparent solar time) or of a fictitious mean sun moving uniformly (mean solar time). The unit, the day, is the time taken for one complete rotation of the earth to bring the sun back to the same direction in the sky. Because the sun appears to move backwards among the stars on account of the earth's orbital motion, any given interval of solar time is longer than the corresponding interval of sidereal time (*q.v.*) in the ratio $366\frac{1}{4}:365\frac{1}{2}$. Apparent solar time kept by the sundial is not quite uniform from day to day; mean solar time kept by ordinary clocks may differ from apparent solar time by as much as 16 mins. See Equation of Time.

Soldering. The joining of metals by an adherent film of a fusible alloy melting at a lower temperature than the fusing point of the work to be soldered. It is distinguished from welding (*q.v.*) by the fact that in the latter process the work to be joined is fused, though additional metal of a similar sort may be added for strength or for filling. In soft soldering, as used for domestic tinsmith work, the solder is an alloy of lead and tin with a small proportion of antimony (tin, 40–50 p.c.). Plumber's solder, used for wiped joints to lead pipes, has about 30 p.c. tin; a solder for electrical work, having high conductivity and great strength, may contain 95 p.c. tin. Melting points range from about 200° C. upwards. Hard soldering is used for work which has to withstand higher temperatures. Here the solder may be a spelter of brass, or one containing silver and copper in varying proportions (silver-solder). The name brazing was applied to the process using spelter as the joining alloy, but is loosely given to hard soldering in general. Melting points for hard solder are from about 850° C.

Requisites for soldering are that the faces of the joint shall be rendered chemically clean, and oxidation prevented, by use of a suitable flux; that the work to be joined shall be raised to a temperature at which the solder will melt

and run; and that the parts to be joined shall be held immovably in the correct position until the solder has cooled and set.

Fluxes used for soft soldering include resin (on tinplate or tinned surfaces); killed Spirit of Salt (*q.v.*), or a solution of zinc chloride and various proprietary solutions or pastes; dilute hydrochloric acid (for soldering zinc). Various non-acid fluxes come into electrical work and other jobs where danger of later corrosion must be avoided. The heat required may be applied by a soldering bit heated over a gas flame; or by an electrically heated bit. Joints may be sweated together by first tinning them (applying a coating of solder), then exposing to heat from a blowlamp, or in a kind of oven, while they are held immovably.

Hard Soldering

Hard soldering requires the heat of a blowpipe, gas torch, or brazing lamp; the temp. varies according to the composition of the solder and that of the metal to be soldered. Borax is a common flux. In "lead-burning," lead pipes, etc., are joined by fusing the lead with an oxy-acetylene torch. A common application of hard soldering is in the capillary process for joining copper pipes and copper-alloy fittings. The parts to be joined are cleaned, and a thin liner of silver solder is placed around between them; on the application of heat by a gas torch the solder melts and flows by capillary attraction around the joint, and unites the parts. In a similar process steel parts (*e.g.* for motor vehicle accessories) are joined by a thin disk of copper or a piece of copper foil placed between them, the work being heated electrically in an oven in the presence of hydrogen, which prevents oxidation.

Soldier (Lat. *solidus*, piece of money). General term applied to one engaged on military service, the equivalent on sea being sailor. Soldiers are sometimes spoken of collectively as soldiery. Adjectives formed from the word, *e.g.* soldierly, suggest bravery and discipline. Soldiers have almost everywhere been treated as a class apart and usually live under a special code of laws and special regulations. See Army; Barracks; Martial Law; Mercenary; War.

Soldiers', Sailors' and Air-men's Families Association. British charitable organization. Founded in 1885 by Sir James Gildea, it had as its object

the relief of distress among the dependents of servicemen. Its work first became national in scope in the S. African War (1899-1902). In 1916 a statutory committee was established, since when the association has worked in cooperation with the ministry of Pensions. In the Second Great War most servicemen voluntarily contributed a regular quarterly sum from their pay to its funds. The headquarters of the association are at 23, Queen Anne's Gate, London, S.W.1.

Soldiers Three. Volume of seven short stories by Rudyard Kipling. "Setting forth certain passages in the lives and adventures of Privates Terence Mulvane, Stanley Ortheris, and John Learoyd," respectively an Irishman, a Cockney, and a Yorkshireman, it was originally published in 1888. Further stories of the same three were included in other collections of stories, e.g. *Life's Handicap*, *Many Inventions*.

Sole (Lat. *solea*, a sandal). Under part of a boot or shoe, that which comes into contact with the ground. Usually made of hard leather to withstand wear and damp, the sole is often protected by nails, tips of metal, or a layer of rubber to prolong its life. *See Boots and Shoes*.

Sole (*Solea solea*). Flat fish. One of the important food fishes, it is usually about a foot long, and



Sole. Marine flat fish, esteemed for the table

is dark brown on the right or upper side, with greyish white beneath. For firmness of flesh and delicacy of flavour it is regarded as one of the choicest of marine fish, and it always commands a high price in the markets. It is often called the Dover sole to distinguish it from the inferior Limande or lemon sole. It is taken in the trawl, and is found on sandy shores from the Mediterranean to N. Denmark.

Sole Bay, BATTLE OF. Naval encounter in the third Dutch War, May 28, 1672. The English and French fleets, numbering some 100 vessels, under the duke of York and the count d'Estrées, had proceeded from Portsmouth to the North Sea and put into Southwold or Sole Bay to water and refit.

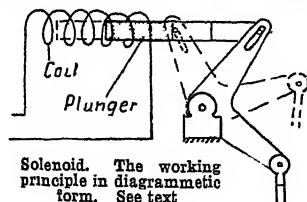
While there the Dutch admiral, De Ruyter, with over 70 vessels, attacked from the N.E., and taking advantage of the sailing dispositions which separated the French and English fleets, concentrated on the English squadron which formed the centre of the allied line. Upon this the French bore away to the S., the brunt of the battle falling on the blue squadron under the earl of Sandwich, whose flagship was blown up. The fight lasted until the remainder of the English fleet came up, the Dutch withdrawing at nightfall. *See* Sandwich, 1st Earl of.

Solecism. Grammatical error, or other offence against the rules of language; by extension, any offence against the conventions of good breeding. It is from the Gr. *solokismos*, used in the same senses, said to be derived from Soli, a town of Cilicia, where the Attic colonists spoke a corrupt Greek.

Solemn League and Covenant. Alliance made in 1643 between the English parliamentarians and the Scots. To counteract the substantial help rendered to Charles I by the Irish, Vane, on behalf of the parliament, effected a contract with Scotland, agreeing, in return for the aid of a Scottish army of 20,000 men, that England should accept the Presbyterian form of church government. The treaty was signed Sept. 25, 1643, and the Covenant was subscribed by large numbers of the English clergy. This League and Covenant must be distinguished from the Scottish National Covenant of 1638. *See* Covenanters.

Solenhofen Stone. In geology, name given to a fine-grained, smooth-textured limestone, derived mainly from Solenhofen in Bavaria. The stone is found in beds of 50 or more ft. thick, is a deposit of the Upper Jurassic, and is particularly rich in fossils, notably those of pterodactyls and the archaeopteryx (*q.v.*). It is unequalled as a lithographic stone. *See* Fossils; Lithography; Rock.

Solenoid. In electrical engineering, a helical coil of insulated wire through which a current is passed. The magnetic field thus set up is used to attract a loose



iron core, or plunger, pulling it up inside the coil. A solenoid is not very effective over large travels, but for short distances considerable power can be developed, pulls up to several thousand lb. over strokes of a few ins. being possible. It is used for the operation of magnetic brakes and for closing large circuit breakers, and in smaller sizes used for relays and contactors.

Solent. Western end of the channel separating the Isle of Wight from Hampshire, England. Extending from Cowes to the Needles, it is 17 m. long and varies in breadth from 2 m. to 4 m. Secure anchorage is found in the Solent, which is a favourite yachting water. *See* Hurst Castle.

Solesmes. Small town of France. It stands on the Sarthe, in the dept. of Sarthe, 18 m. from La Flèche. It is famous for its abbey. The abbey buildings are modern, save only the church, which contains two famous pieces of sculpture. There was a religious house at Solesmes in the Middle Ages, but this fell into decay. A Benedictine house, founded in 1831, existed until 1901. *Pron.* Sô-laym.

Solesmes. Town of France, situated on the river Selle, 12 m. E. of Cambrai, in the dept. of Nord. Its chief industry is the manufacture of linen. Pop. 7,000.

Sole Trader. Person in business on his (or her) own account, without a partner and not as a shareholder of a company, and thus entirely responsible for running the business and for its liabilities, and entitled to receive all profits. This form of business is common among shopkeepers, agents, professional men, farmers, and among manufacturers whose product does not require extensive (and therefore expensive) machinery or premises.

Soleure. French name for a canton and town of Switzerland, also known by the German name Solothurn (*q.v.*).

Solfatara (Ital., from *solfo*, sulphur). Type of dormant volcano, which emits only gases, especially sulphuretted hydrogen, carbon dioxide, and hydrochloric acid. The French equivalent is *soufrière*. Solfataras are common in the volcanic regions of Italy, the best known being that near Pozzuoli (*q.v.*), the last eruption of which occurred in 1198. Its vapours are used for the cure of cutaneous diseases. The Soufrière in St. Vincent, W. Indies, is a volcano in the solfatara stage. *See* Volcano.

Solfeggio. Vocal exercise utilising Guido d'Arezzo's solmisation syllables Do, Re, Mi, Fa, Sol, La, Si, Do. The first syllable was originally Ut, d'Arezzo's words being the initial syllables of a hymn to S. John. This system is that of a fixed Do, not to be confounded with the Tonic Sol Fa (*q.v.*) method.

Solferino. Village of Italy in the prov. of Verona. It is 73 m. E. of Milan on the hill bordering the S. shore of Lake Garda.

The battle of Solferino, fought June 24, 1859, was a victory of the French over the Austrians. The battles of Montebello, Palestro, and Magenta had effectually weakened the Austrian hold on Lombardy, and Victor Emmanuel II and Napoleon III passed through Milan and marched towards the Mincio, which formed one side of the Quadrilateral (*q.v.*). Here they met the Austrian army of 140,000 men which had taken up its position round Solferino. The Piedmontese were engaged at San Martino when Napoleon arrived before Solferino and took command of the French. The attack on Solferino was brilliantly executed by the French, while the generalship of MacMahon and Niel gradually overcome the stubborn resistance of the Austrians, who finally retreated. The French losses were 12,000; the Austrian, 20-25,000.

Soli (Gr. *Soloi*). In ancient geography, a town of Cilicia, in Asia Minor. A flourishing colony of Rhodes, it was destroyed by Tigranes, king of Armenia, who removed the inhabitants to Tigranocerta. Restored by Pompey, who repopled it with pirates, it was afterwards called Pompeiopolis.

Solicitor (Lat. *solicitare*, to ask earnestly). Term used in England and Scotland for a member of the lower branch of the legal profession. Professionally a solicitor is an officer of the supreme court.

Solicitors have no right to appear as advocates in the high court, or the supreme court, except before a judge sitting in chambers; but they may be advocates in coroners', police, and county courts, and sometimes at quarter sessions. In England the Law Society is the registrar of solicitors, prescribes and conducts their examinations, and exercises discipline over them subject to the judges of the high court. The time of apprenticeship is from 3 to 5 years according to education. A solicitor who commits any crime, or is guilty of any misconduct, such as cheating a client, may be complained of to the Law Society (Chancery Lane,

London), which by disciplinary committee holds an inquiry into the charges. If a solicitor is found guilty the committee may suspend him for a limited period or strike him off the roll. The solicitor can appeal to the high court.

A solicitor who has once undertaken a lawsuit cannot drop it so long as the client demands that he shall go on, and supplies him with funds for the purpose. Unlike a barrister, a solicitor may sue for his fees; but before doing so must deliver to the client a signed bill, and then wait a month. This delay is to enable the client to have the bill taxed. (*See Taxation of Costs.*) But a solicitor may, before undertaking any business, stipulate for a special rate of payment, or a lump sum, and can enforce the contract, provided that the client agrees in writing under his hand. Unlike a barrister, a solicitor is liable to his client in damages for negligence. A solicitor has a lien on his client's papers in his hands for his costs. An effort to bring about fusion between barristers and solicitors was defeated by members of the Law Society in 1919. By the Sex Disqualification (Removal) Act, 1919, women became eligible as solicitors. *See Barrister; Law Society.*

Solicitor-General. In England one of the law officers of the crown. He ranks second to the attorney-general, and the duties of the two are to advise the various depts. of the govt. on legal matters. The solicitor-general is usually a member of parliament, but not of the cabinet, and must be a barrister of standing; his salary in 1946 was raised to £7,000, any fees payable being set off against it. He was first appointed in the time of Edward IV, and following the English precedent there are now solicitors-general for Scotland, Canada, Australia, S. Africa, and other parts of the Empire. In the U.K. and the self-governing dominions this official is a party politician, *i.e.* he leaves office with his party.

Solid. In mathematics, a three-dimensional figure occupying space and having length, breadth, and thickness. Physically the solid state is one of the three states of matter, which Sir Oliver Lodge defined as having form and volume in contrast to a liquid which has volume without form. An ideal solid is one which completely returns to its original shape after the removal of the stress to which it has been subjected. Some solids exhibit different properties

in different directions, *e.g.* wood has a different elastic modulus in the direction of the grain than across it. A solid may be distinguished by various physical properties, *e.g.* coefficient of expansion, hardness, ductility, etc.

The solid state is thus the state of matter in which the molecules are considered to be vibrating with a very small amplitude about an equilibrium position. As the temperature is raised, the average amplitude of the vibrations increases, so that the substance expands against the attractive forces between the molecules. At a certain temperature the vibrations become sufficiently intense for any particular molecule to break away from its neighbours and to come under the influence of another group. At this stage the melting point of the solid will have been reached.

The attractive forces between the molecules is known as the force of cohesion, and is the agency which maintains the shape of the body. A solid resists compression, indicating the presence of a repulsive force which becomes operative as the molecules get closer together.

Solidifying Point. In physics, the temperature at which a cooling liquid begins to solidify. The temperature remains unaltered until solidification is complete. Experimental observation shows that the solidifying point of a substance is identical with its melting point.

Solid Solution. A solid phase in alloy systems whose composition is variable between certain limits. Solid solution may be based on either a pure metal or an intermediate constituent, the solute atoms being incorporated into the crystal lattice of the solvent metal or constituent. *See Lattice; Super-lattice.*

Solidus. Roman gold coin. It was struck to replace the aureus, and was also known as the bezant, or Byzantine solidus. This coin was a standard in the Eastern Empire till 1453. The solidus was used in Great Britain until the 7th cent., and was adopted by the Franks until the time of Pepin. The silver solidus was valued at one-twentieth of a libra and was worth twelve denarii. The Italian *soldo* (now obsolete) and French *sou* are deviations from solidus, which has given us the s in £ s. d. (*libra, solidus, denarius*).

Solifluxion. In geology, a process of erosion encountered in sub-arctic regions. The surface

soil, permanently frozen at depth, becomes saturated with water from melting snow. The mud so formed cannot lose its water by percolation downwards, and so the whole mass flows laterally downhill, and spreads out on low level ground. Coombe Rock was probably a product of solifluxion when the ice sheets extended as far S. as the Chiltern Hills. *See* Ice Age.

Solihull. Urban district and market town of Warwickshire, England. It is 6 m. S.E. of Birmingham on the rly. At the grammar school, founded in the 14th century, the poet Shenstone was a pupil. The church is Early English and Perpendicular restored. Solihull Hall dates from the 14th century, and there is a small town hall. Solihull gives its name to a co. constituency. Market day, Thurs. Pop. of dist., 65,500.

Solingen. Town of W. Germany, in N. Rhine-Westphalia. It is situated near the Wupper, 11 m. E.S.E. of Düsseldorf. Standing on the Westphalian coalfield, it is chiefly noted for its cutlery, while steel articles of almost every other kind are also produced. Solingen was made a town in 1374, but before that time its sword-blades were noted. An important armament centre during the Second Great War, the town was heavily damaged by bombs. After the war it came within the British zone of occupation. Pop. 145,000.

Solitaire. Name of a game played by one person. In the U.S.A. it denotes a patience card game; in the U.K. a game in which marbles placed in round hollows on a board are "jumped" and removed as in draughts, in such order that the last remaining marble is left in the central hollow. This game is said to date from the 17th century. The word also denotes a precious stone when set by itself, e.g. in a ring, and a kind of loose necktie fashionable for men in the 18th century.

Solitaire (*Pezophaps solitaria*). Large flightless bird of the pigeon family. Formerly abundant in the island of Rodriguez, it is now extinct. It was about the size of a turkey, but longer in the neck and legs; and the plumage was brownish grey. The wings were too small to serve the purposes of flight.

Solitary Confinement. Imprisonment and isolation of criminal and other offenders. In England, under the Criminal Law Consolidation Acts, 1861, many offences were punishable with solitary confinement at the discretion

of the court; and the Prison Act, 1865, made the separate system the normal prison discipline. Prisoners left their cells only for chapel and exercise. The Prison Act, 1898, virtually abolished the system, but confinement to cell for 3 days survived as a punishment for breach of prison discipline until 1949, when it became permissible only for refractory or violent prisoners.

Sollas, WILLIAM JOHNSON (1849-1936). British geologist. Born at Birmingham, May 30, 1849, and educated at the City of London school, the Royal School of Mines, and St. John's College, Cambridge. He was a university extension lecturer, 1873-78. He was professor of geology and zoology at University College, Bristol, 1880-83; of geology and mineralogy at Dublin until 1897; thereafter of geology and palaeontology at Oxford. President of the Geological Society, 1908-09, he wrote books on geology, mineralogy, and zoology, including *The Age of the Earth*, 1905; *Ancient Hunters and Their Modern Representatives*, 1911. He died Oct. 20, 1936.

Sollum. Gulf and small port in the extreme W. of Egypt. The approach to Sollum by land is along the coast through Mersa Matruh, to which point a rly. has been constructed from Alexandria. The port of Sollum is of small commercial value, but significant in connexion with the control of the Senussi (*q.v.*) of the interior. During the First Great War Sollum was occupied by the Senussi, but was retaken by the British, and used as their principal base in operations against the tribesmen.

In the Second Great War the Italian army occupied Sollum, Sept. 13, 1940, the British garrison having withdrawn. They were driven out on Dec. 16, during Gen. Wavell's advance into Cyrenaica; but the port fell to Rommel's forces, April 14, 1941. During 1941-42 it changed hands no fewer than five times, the final occasion being its occupation by the British 8th army, Nov. 10, 1942, after their victory at Alamein.

Solo (It., alone). (1) In music, a part for a single voice or instrument, whether accompanied or not. The term is used rather loosely. A pianoforte piece, though consisting of many parts, is called a solo, but a string quartet, though performed by soloists, is not. (2) The solo organ is an extra manual found in large instruments, on it being placed stops suitable

for solo effects, i.e. played in single notes by one hand, while the harmonic accompaniment is supplied by the other hand and the feet. It is as a rule placed above the swell organ. *See* Singing.

Solo or **SOLO WHIST.** Popular card game. It is a development of whist (*q.v.*). The principal divergence from the parent game is that each player acts independently, except in one call. There are four players, the cards hold the same values as in whist, the players out for deal, and the dealer first gives cards to the player on his left, distributing three cards at a time to each player until the last round, when the remaining four cards are dealt singly, the last one being faced for trumps. The player on dealer's left has first call, and the calls are as follows:

(1) *Proposal and acceptance.* If a player thinks he can make four tricks, he "proposes" on the chance that another player may be able to do the same and so "accept," thus contracting to make between them eight tricks in order to win what is commonly called a "prop and cop." This is the only instance in solo where two players act as partners.

(2) *Solo.* A player undertakes to make five tricks; all the others doing their best to prevent him.

(3) *Misère.* A player backs himself to lose every trick.

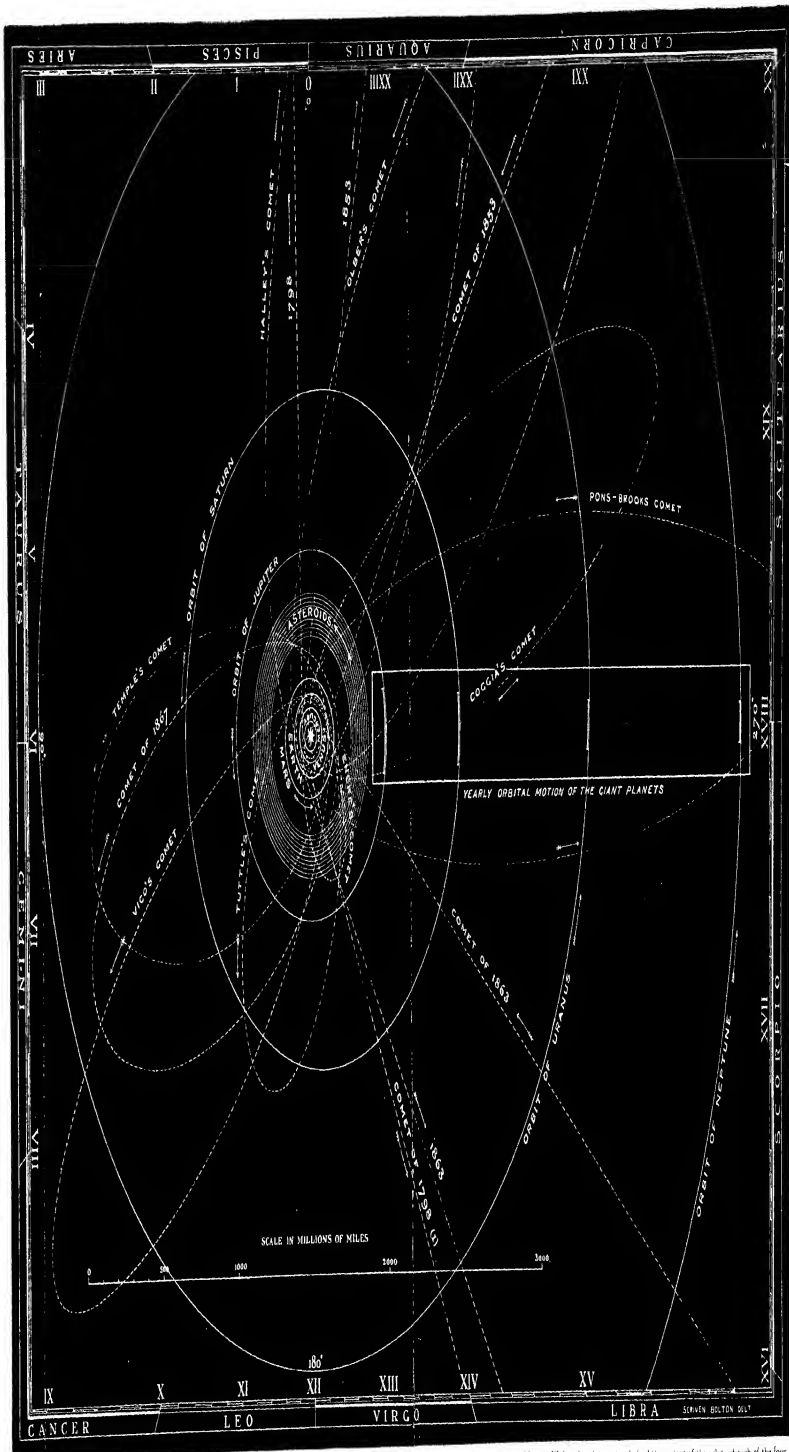
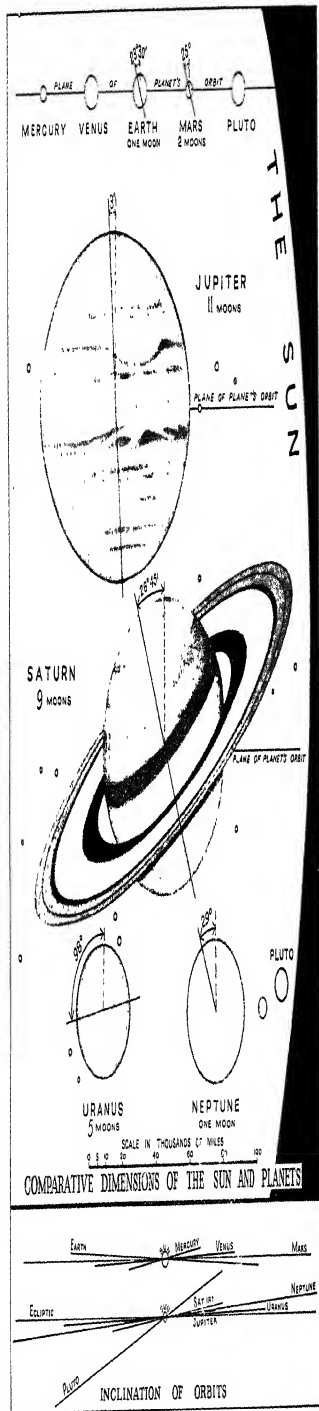
(4) *Abundance.* The caller undertakes to make nine tricks, choosing his own trump suit. A player calling abundance on the trump suit originally turned up takes precedence.

(5) *Misère ouverte.* The same as misère, except that after the first trick the caller must expose his hand upon the table; but he may play any card he chooses consistent with the rules.

(6) *Abundance déclarée.* All thirteen tricks must be made, the caller naming his own trumps and having the right to lead.

The call rests with the player calling the highest; should all pass, the original caller has another opportunity to go solo, as also if his proposal was not accepted; but should he refuse there is a fresh deal. The player on dealer's left leads first. *See* Whist.

Solo, BENGAWAN, OR SAMBAYA. River of Java. It rises among the mts. near the S. coast, and flows with many meanders over the lowlands, to reach the sea by two mouths opposite the island of Madura, after a course of 310 m. The lower portion is used for shipping.



The above illustrations, which are virtually self-explanatory, show the true features of the solar system. On the left the Planets are drawn to scale in relation to a segment of the Sun, which is in white. On the right the elliptical orbits of the Comets are shown by dotted lines. Within the white rectangle (right) a section of the orbits of each of the four giant Planets is specially marked to show how far the Planets travel in one year, the section for Jupiter can be recognized readily as about one-eighth of the orbit, Jupiter taking nearly twelve years for each revolution. The orbit of Pluto has been omitted as it is not concentric, overlapping that of Neptune, and as a plan of this scale, not enough of it would appear to give any helpful indication.

THE SOLAR SYSTEM; THE SUN, THE PLANETS AND THEIR SATELLITES, AND THE COMETS

Sologne (anc. *Secalaunia*; from Lat. *secale*, rye). District of central France, sometimes called La Sologne. It lies between the Loire on the N. and the Cher on the S., and is a flat, marshy district comprising much of the three departments of Cher, Loir-et-Cher, and Loiret. About 1860 much of it was planted with pine trees, and many of its ponds were drained; this rendered it less unhealthy, while it was further improved by new roads. It is now a farming and sporting district, through which the Cosson, the Beuvron, and the Sauldre flow. It covers about 2,000 sq. m. Before 1685 it was prosperous and thickly peopled, but it suffered when the Huguenots left the district after the revocation of the edict of Nantes in 1685.

Solomon (d. c. 937 B.C.). Third king of Israel. Also named Jedidiah, he was a younger son of David, by his wife Bathsheba. A youth at his father's death, about 969 B.C., Solomon had already received assurance of the succession, on the attempt of his half-brother Adonijah to secure it, and after his accession sanctioned the execution of his rival and of Joab. Solomon waged few wars, but consolidated his power by alliances, marrying a daughter of Pharaoh, perhaps the last of the Tanite dynasty, a daughter of Hiram, king of Tyre, and other foreign princesses.

His relations with Phoenicia and Egypt enabled him to share in the traffic with Ophir and other distant countries, and he accumulated wealth which made his reign proverbial for splendour, though his vast harem and extravagant display exhausted the national resources. For his great buildings at Jerusalem, the temple, the palace, the fortress Millo, etc., Solomon employed forced labour, thus provoking the discontent which resulted on his death in the secession of the N. tribes.

He was renowned for his wisdom as a judge and an author of songs and proverbs, as well as of discourses on plants and animals; but although parts of the collection known as Proverbs may be his, the other extant works attributed to him, viz. Canticles, Ecclesiastes, Wisdom, and the Psalms of Solomon, were composed in later ages. In Jewish and Mahomedan legend Solomon is a great magician, the controller of armies of demons. The account of Solomon in 2 Chron. 1-9, representing the late priestly point of view, is more favourable than that given in 1 Kings 1-11.

See Miserere; Temple. Consult King Solomon, F. Thieburger, 1948.

Solomon. Professional name of Solomon Cutner (b. 1902), British pianist. This London boy played



Solomon,
British pianist

at a Queen's Hall concert at the age of 8; studied in Paris; and reappeared as a soloist at Wigmore Hall in 1921. He joined the ranks of leading British exponents, excelled in Brahms and Beethoven, and was associated with the concerto of Arthur Bliss. Among repeated foreign tours was his remarkable effort of giving 30 concerts to troops between Gibraltar and Cairo in one month in 1943. Solomon was made C.B.E. in 1946.

Solomon, SOLOMON JOSEPH (1860-1927). British artist. Born in London, Sept. 16, 1860, he studied at Heatherley's and the R.A. schools, and in Munich and Paris. A vigorous painter of historical subjects and portraits, he was elected A.R.A. in 1896, R.A. in 1908, and became president of the Royal Society of British Artists, 1918. During the First Great War he was the first to recognize the usefulness of camouflage as a means of defence, and introduced it to the British army, inventing in 1916 the network which formed the basis of military camouflage. He wrote *Strategic Camouflage*, 1920. He died July 27, 1927. Consult *Life*, O. S. Phillips, 1933.

Solomon Islands. Archipelago in Melanesia, South Seas. Of the seven chief islands, Bougainville is administered by Australia; Choiseul, New Georgia, Ysabel, Guadalcanal, Malaita, and San Cristoval form a British protectorate with a resident commissioner on Guadalcanal. There are also numerous smaller islands, among them Buka, the Treasury Is., Vella Lavella, Kolombangara, Shortland, Rendova, and the Russell Is. All are volcanic and mountainous; their forests produce ebony and sandalwood, other principal products being rubber, copra, gold, mother-of-pearl, and tropical fruits. Malaria is prevalent.

After the first discovery of the Solomons by the Spaniard Mendana, who named them, in 1568, later explorers sought them in vain until Carteret in 1767 and Bougainville in 1768 found them again.

Attempts in the 19th century to colonise and Christianise the group were not welcomed by the islanders, who murdered a number of white men, missionaries and others. In 1893 Ysabel, Choiseul, and Bougainville fell to Germany by treaty, and the other islands became a British protectorate. Ysabel and Choiseul were exchanged by Germany for territory in Samoa and added to the protectorate in 1900. After the First Great War Bougainville was placed under Australian mandate by the League of Nations, and became part of the territory of New Guinea. The group has an area of 16,500 sq. m. Pop. 145,000.

SECOND GREAT WAR. The Japanese landed on Bougainville at Kieta on April 6, 1942, and the whole group was soon in their possession, for the Solomon Is. were not fortified. Allied reconquest began when, on Aug. 7, U.S. Marines landed on Guadalcanal (g.v.). Japanese resistance was determined, and it took the Americans until Feb. 10, 1943, to get control of that island. On Feb. 21 U.S. Marines seized Banika and Pavuvu in the Russell Is., evacuated by the Japanese before the Allies landed. Marines landed at Segi Point, on New Georgia, on June 20, and on July 1 took Viru. A landing on Rendova on June 30 was followed by further landings of U.S. and N.Z. forces on New Georgia; it was Aug. 28 before Japanese resistance was overcome. On Aug. 15, N.Z. troops with U.S. support landed on Vella Lavella; Kolombangara was pounded from land, sea, and air; between Oct. 1 and 9 the Japanese evacuated both these islands. On Oct. 27 Allied troops seized the Treasury Is.; on the 28th U.S. Marines landed on Choiseul, evacuating it, however, on Nov. 12, when the Japanese moved their troops from there to Bougainville. U.S. Marines landed in the Empress Augusta Bay, Bougainville, on Nov. 1, and seized Cape Torokina and a small area in the vicinity. These conquests rendered the remaining Japanese in the Solomons group innocuous to the Allies; but fighting was still continuing on Bougainville when Japan surrendered, Aug., 1945. Australia had taken over responsibility for operations in the group in Nov., 1944, and it was to Lt.-Gen. Savage, commanding the Australian 2nd corps, that Lt.-Gen. Kanda, Japanese commander, surrendered at Torokina, Sept. 8, 1945, the 20,000 men still under his command.

Solomon's Seal (*Polygonatum multiflorum*). Perennial herb of the family Liliaceae. A native of Europe and N. Asia, it has a thick, branched, creeping rootstock, and leafy arching stems. The large oblong leaves form two rows, and the greenish-white, tubular, bell-

main ridge of the Jura Mts. and part of the Aar valley. Farming occupies many of the inhabitants, most of whom are German-speaking Roman Catholics. Industries include watchmaking (Grenchau) and machine making (Olten). Its area is 302 sq. m. Pop. 144,198.

Solothurn or **SOL-**

EURE. City of Switzerland, capital of the canton of the same name. It is a walled city on the Aar, 20 m. N.N.E. of Berne, and is an important rly. junction. The 18th century cathedral of S. Ours, built on the site of an earlier church dating from 1050, is the cathedral church of the bishopric of Basel. The town hall, the arsenal, and a 13th century clock-tower with a 16th century clock are notable buildings; the museum contains an interesting geological collection from the Jura Mts. Quarrying and watch-making are the chief industries. The town was a free imperial city in 1218, and had extended its authority over the land comprised in the present canton before 1481. Pop. 15,414.

Solovetsk. Group of islands in the White Sea at the entrance to the Gulf of Omega. On the largest of these, Solovetsk, there is a famous monastery, one of the wealthiest in Russia, founded in 1429. The stone buildings were erected in the reign of Ivan the Terrible by Abbot Philip, whose remains rest in the cathedral of the Transfiguration.

Solstice (Lat. *sol*, sun; *sistere*, to stop). Point in the ecliptic at which the limit of extreme N. or S. declination is reached by the sun. At such points the sun appears to stand still. The summer solstice is June 21 and the winter Dec. 21, coinciding approximately with the longest and shortest days. See Equinox. *Pron.* solstiss.

Solution (Lat. *solvere*, to dissolve). In chemistry, name given to certain types of mixtures of two or more substances. These substances may be solid, liquid, or gaseous, and the mixture so formed is homogeneous.

The commonest forms of solutions are liquid. Gases dissolve in liquids according to Henry's law, which states that the mass of any gas absorbed by a liquid is proportional to the pressure of the gas, and decreases as the temperature increases. The law only applies to gases which have a low solubility. With high solubility

the probability is that a chemical action takes place which apparently invalidates the law. The decrease of solubility with pressure is seen in the familiar example of opening a bottle of aerated waters, the dissolved gases immediately beginning to bubble out from the liquid.

Liquids mix according to no well-defined law, but the mixing is important, as upon it depend fractional distillation processes.

As a general rule, solids dissolve in liquids at a rate depending upon the temperature, but the rule has a number of notable exceptions, *e.g.* solubility actually decreases with increase of temperature. Salt dissolves very little more in hot water than cold, while saltpetre dissolves nearly twenty times more in boiling water than in water at freezing point. When a liquid has dissolved as much of the solid as possible, it is said to be saturated. A solid is precipitated from a saturated solution on cooling, as a rule, and generally in the form of crystals.

Solid solutions are of two kinds, the solution of gases in solids and the solution of solids in solids. The occlusion of hydrogen in palladium is a well-known example of the former, and some alloys and amorphous mixtures, as glass, of the latter.

Solutions were formerly not distinguished from chemical compounds, but though it is now known that chemical action does not take place, the true nature of solutions has still to be settled. From considerations of osmotic pressure, it has been shown that the solute obeys the laws for gases, *e.g.* Boyle's, Avogadro's, etc. This suggests that the molecules of the solute are in the same state as they are when the solute is a gas. The kinetic theory of gases fits in very well, in fact, with many properties of solutions, but in certain solutions, *e.g.* those of mineral salts in water, which are conductors of electricity, the osmotic pressure is higher than theory. In such solutions, *e.g.* a salt solution in water, it is supposed that there are certain free ions of sodium and chlorine, carrying positive and negative charges respectively of electricity, and differing in their properties from the actual elements. This theory fits in with many of the observed facts of electrolytic solutions. See Osmotic Pressure.

Solutrian. Middle period of the upper Palaeolithic age in Europe. The climate was cold



Solomon's Seal. Spray of leaves and flowers

shaped flowers hang from the lower side of the arch. The flowers are succeeded by small, blue-black berries.

Solon (c. 638-c. 558 B.C.). Athenian statesman and law giver. Of noble birth, he spent his youth in foreign trade, and attained such eminence as a gnomic poet that he was accounted one of the Seven Sages. Having by one of his poems incited the Athenians to expel the Megarians from Salamis, he commanded the expedition which conquered that island. As Athens was suffering great distress from an economic and political crisis, Solon was elected archon in 594, with full power to amend the laws. By his disburdening ordinance he cancelled existing debts, forbade enslavement for debt, and limited the rate of interest.

Repealing most of Draco's legislation, he gave Athens a new constitution. With a view to obliterating clan divisions and feuds, the citizens were divided into four classes, according to their wealth, and on this basis taxation and admission to office were regulated. Solon increased the powers of the *boulé* or senate, and of the *ecclesia* or assembly. Other laws encouraged industry and foreign trade, especially that establishing a new monetary standard. Having induced the people to swear that they would not change his laws for a term of years, Solon travelled in Egypt, Cyprus, and perhaps in Lydia, where he is said to have advised Croesus. Soon after the overthrow of his constitution by Peisistratus (*q.v.*), Solon died in retirement. See Greece. Consult Solon the Liberator, W. J. Woodhouse, 1938.

Solothurn or **SOLEURE** (anc. *Salodurum*). Canton of N.W. Switzerland, admitted to the confederation in 1481. It occupies the N.W. of the republic and contains the

(horse, reindeer, mammoth), and the human burials indicate an eastern race, apparently dominating for a time the Aurignacian. It was named from a rock-shelter at Solutré, Saône-et-Loire.

Solvent. Term used in chemistry to denote the bulk of a solution, e.g. water, the dissolved substance being called the solute. Water is the greatest general solvent, but alcohols and numerous other organic compounds are also used.

Solway Firth. Arm of the Irish Sea. It separates the Scottish counties of Kirkcudbright and Dumfries from the English county of Cumberland, extends inland for 38 m., and has a breadth varying from 22 m. between St. Bees Head and Balcary Point to 1½ m. where the Esk flows into it. In addition to the Esk it receives the waters of the Annan, Dee, Nith, and Urr on the Scottish side, and the Derwent, Eden, and Ellen on the English side of the border.

At low tide much of the firth is dry, but the returning tide is extremely rapid and a bore sweeps in at the rate of ten miles an hour, sometimes causing damage to shipping. The fisheries are extensive, the salmon catches being of great value. The Solway rly. viaduct, connecting Bowness with a point of the Scottish coast S. of Annan, was opened in 1869, and reopened in 1884 after destruction by floating ice three years earlier. It is 1,960 yards long.

Solway Moss. Dist. in Cumberland, England. Situated between the rivers Sark and Esk on the Scottish border, it is reclaimed bogland, having a circumference of some seven miles. A number of villages were overwhelmed and destroyed in 1771 through the overflowing of the waters of the bog caused by excessive rains.

Solway Moss was the scene of the defeat of James V of Scotland by the English on Nov. 24, 1542. He had marched with 18,000 men into Cumberland, where he was met by a much smaller force of English under Sir Thomas Wharton. The encounter was a rout, not a battle. Without striking a blow, the Scots fell back in panic haste and disorder to the Esk, then running high, and to the marshes of Solway Moss. Some were drowned, and about 1,200 were taken prisoner in the bog.

Solyman, OR SULEIMAN THE MAGNIFICENT (c. 1495-1566). Sultan of Turkey. Son of Selim I, he inherited his father's ambitions and valour, and on ascending the throne in 1520, having crushed



Solyman the Magnificent, Sultan of Turkey

rebellions in Syria and Egypt, began a series of campaigns against the Western powers. Belgrade, 1521, and Rhodes, 1522, fell to his armies, and at the battle of Mohacs (q.v.), August 29, 1526, he dealt a crushing blow to the Christian armies of Louis II. In 1532 he advanced to within a few miles of Vienna, which was only saved by the timely succour of Charles V. He still held Hungary, however, and in alliance with Francis I of France ravaged the Mediterranean coasts as far as Nice and Tripoli, 1542.

The remaining years of his life were spent in wars against Persia, the Knights of Malta, and Spain. Completely under the influence of Roxalana, the beautiful Russian slave whom he had freed and married, Solyman caused his legitimate offspring to be bow-stringed in order to give the succession to her son, who succeeded him as Selim II (q.v.). Solyman died Sept. 4, 1566.

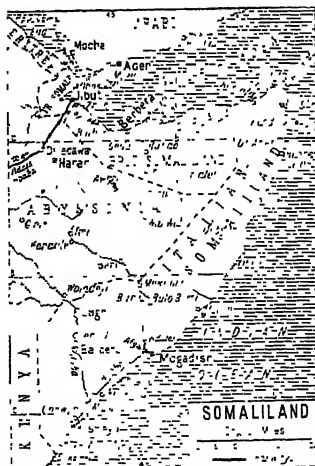
Soma. In the ancient religion of India, name of a sacred plant, from which an intoxicating juice was extracted, and of a god identified with it. It was probably *Sarcostemma brevistigine* or some other plant of the Asclepiadaceae, several of which are still used sacrificially by Brahmans and Parsees. The 9th book of the Rig Veda consists of hymns to Soma. As the drink of Indra and other gods, it was poured in libation and drunk by the worshippers.

Somali. People of Hamitic stock, forming the main population of the E. horn of Africa. Numbering under 1,000,000—approximately one-third each in British, the former Italian, and Abyssinian Somaliland—there are outlying subtribes, mostly Isa, in French Somaliland, and scattered off-shoots, much negriified, down to the Tana river in Kenya Colony. The purest type are a stalwart, lithe, dark people, 5 ft. 7 ins. in height, long-faced, thin-lipped, and straight-nosed, with ringlety hair. Brave, excitable, pastoral nomads, with vast herds of sheep, camels, and goats, they live under patriarchal conditions of Arabian origin. The coast-dwellers practise agriculture, fishing, and handicrafts. Islam is professed, but some early Hamite animism survives. The

King's African Rifles are recruited from them.

Somaliland, BRITISH. Protectorate in N.E. Africa. It comprises the hinterland of that portion of the Somali coast on the Gulf of Aden between Loyi-Ada and Bandar Ziade (400 m. approx.). It was administered, 1929-40, by the British Colonial office through a military governor, and, after the reoccupation of 1941, by the War office. British lies between French Somaliland and the former Italian Somaliland, and adjoins Abyssinia in the W. and S. though the frontiers remain indefinite. Only the coast strip, where are Berbera, Zeila, and Bulhar, the chief towns, is effectively controlled and developed; the hinterland is a barren steppe, mountainous, with peaks attaining 6,000 ft. The climate is hot and, for Europeans, unhealthy. Rice, textiles, dates, and sugar are imported, mainly from India; skins, hides, cattle, sheep, camels, donkeys, gums, and resins are exported. The monetary unit is the Indian rupee. The country was at one time administered by the India office. Area 68,000 sq. m. Pop. (1947 est.) 700,000, only a few score of whom are Europeans.

The British first established the protectorate 1885-87, when the Egyptians withdrew in order to concentrate their forces in meeting the onslaught of the Mahdi. From 1901 to 1920 a great deal of trouble was caused by a local Mahdi, who became known as the Mad Mullah. He fought the British so persistently that in 1910 they were obliged to withdraw from the interior.



Somaliland. Map of the British, Italian, and French colonies on the east coast of Africa

For activities in British Somaliland in the Second Great War, see East Africa Campaigns.

Somaliland, FRENCH. Colony in N.E. Africa. It adjoins Eritrea near the Strait of Bab-el-Mandeb, has an inland frontier with Abyssinia, a coastline on the Gulf of Aden, and adjoins British Somaliland in the S.E. France obtained Obock in 1862, further territory in 1884, created Jibuti, the capital and seaport, in 1888, and later developed rly. communication with Addis Ababa, capital of Abyssinia, Jibuti becoming the chief port for that country. Salt mines and fisheries provide the main occupations, salt, coffee, ivory, hides, and skins being the chief exports. French Somaliland sends one deputy to the French national assembly, one to the council of the republic, and one to the assembly of the French union. Est. pop. (1946) 44,800.

Somaliland, ITALIAN. Name given to the hinterland of that portion of the Somali coast from British Somaliland to Dick's Head, Kenya Colony. An Italian colony from 1927, it was in 1936 incorporated with Eritrea and Abyssinia in the govt. of Italian East Africa. Wrested from Italy in the Second Great War, the country was administered by the British 1941-50, then restored under U.N. trusteeship to Italy for 10 years. The capital is Mogadishu, from which a rly. line runs to Afgai and Adalei. Other towns are Kismayu, Bardera, and Bullo Burti. The chief rivers are the Juba and the Webi Shebeli. Pop. (1939) 1,021,572.

For the campaign in Italian Somaliland in the Second Great War, see East African Campaigns.

Sombrero (Sp. *sombra*, shade). Broad-brimmed felt hat. It originated in Spain, but is worn largely in Central and South America.

Somers, JOHN SOMERS, 1ST BARON (1651-1716). English statesman. Born at Claines, near Worcester, March 4, 1651, and educated at Worcester cathedral school and Trinity College, Oxford, he entered the Middle Temple, 1669. An expert in civil law, he



Lord Somers, English statesman

part in framing the Declaration of Right. William III's most trusted minister, Somers was knighted, 1690, appointed lord keeper, 1693, and lord chancellor, 1697, when he was made Baron Somers of Evesham. Attacked by the Tories, he was deprived of the great seal, 1700, and impeached by the commons, 1701, but acquitted by the lords. Anne was hostile to him, but under George I he was a member of the privy council and had a seat in the cabinet without office, 1714. He died April 26, 1716. The Somers Tracts, a valuable collection of state papers, were edited by Sir Walter Scott, 1809-15.

Somers, ARTHUR HERBERT TENNYSON SOMERS COCKS, 6TH BARON (1887-1944). British boy



Lord Somers, British boy scout chief

scout chief. Born Mar. 20, 1887, he inherited the barony on the death of an uncle, 1899. He served in the First Great War, gaining the D.S.O., the M.C., and the French award of chevalier of the Légion d'Honneur, retiring from the army in 1922. In 1920 he became district commissioner of boy scouts in Herefordshire, and while governor of Victoria, 1926-31, was chief scout of that province. Acting governor-general of Australia, 1930-31, he was also chief scout of Australia. While Lord Baden-Powell, the chief scout, was in S. Africa in 1936, he acted as chief scout in Gt. Britain and continued as deputy chief scout until Baden-

Powell's death in 1941, when he became chief scout of the British Commonwealth. Lord Somers, who was made K.C.M.G. in 1926, died July 14, 1944. His wife, Daisy Finola, chief commissioner of the girl guides 1942-49, was awarded the C.B.E., 1950.

Somerset. Co. of England. In the S.W. of the country, it has a long coastline on the estuary of the



Somerset arms

Severn and the Bristol Channel. The hills include the Mendips in the N.E., and the Quantocks and the Brendons in the W. Minor ranges are the Polden Hills and the Black Down Hills. The highest point is Dunkery Beacon on Exmoor. The chief rivers are the Avon and Parret; others are the Axe, Tone, Brue, Yevo, and Cary. Somerset is on the whole a fertile area, the vale of Taunton being especially so. Wheat, barley, and oats are grown, and there are extensive orchards of cider apples. Sheep and cattle are reared, and there are many dairy farms. There is a coalfield in the north of the co., Radstock being the mining centre.

Taunton is the county town. The boroughs include Bath, Bridgwater, Wells, Yeovil, and Chard, and there are a number of smaller places, several, among them Dunster, having once been prosperous trading towns. Among urban districts are Wellington, Clevedon, Shepton Mallet, and Street. In Somerset are many places of interest: Cheddar, with its rocks and caves, the plain of Sedgemoor, and



Somerset. Map of the English county famous for its historic associations

part of Exmoor; Weston-super-Mare and Minehead are holiday resorts on the Bristol Channel; Watchet and Porlock are small seaports; Glastonbury and Athelney are associated with the early history of England. The county is almost wholly in the diocese of Bath and Wells, and elects six M.P.s. Somerset was the heart of the kingdom of Wessex, its old capital, Somerton, being herein. Area 1,613 sq. m. Pop. 475,142.

LITERARY ASSOCIATIONS. Prior Park, near Bath, was the original of the residence of Squire Allworthy in Fielding's *Tom Jones*; while Bath itself recalls Smollett's Humphrey Clinker, Sheridan's *The Rivals*, Jane Austen's *Persuasion*, Dickens's *Pickwick Papers*, and George Meredith's *The Tale of Chloe*. Clevedon Court is the Castlewood of Thackeray's *Esmond*, and Clevedon church inspired passages in Tennyson's *In Memoriam*. Exmoor may be said to have a literature of its own, including Blackmore's *Lorna Doone* and J. W. Fortescue's *Story of a Red Deer* in prose, and Newbolt's *Song of Exmoor* in poetry.

Bibliography. *Bygone Somerset*, J. C. Walters, 1897; *Victoria History of the Counties of England*, Somerset, 2 vols., ed. W. Page, 1911; *Somerset in Bygone Days*, W. J. Tate, 1912; *Highways and Byways in Somerset*, E. Hutton, 1912; *Somerset (The King's England series, ed. Arthur Mee)*, 1940; *Companion into Somerset*, J. H. Ingram, 1948.

Somerset, or North Somerset. Island in the N. American archipelago. Part of the North-West Territory of Canada, it is divided from the mainland by the Bellot Strait. It is separated on the E. from Baffin I. by the Regent Inlet, and on the W. from Prince of Wales I. by Peel Sound. To the N. are Devon I. and Cornwallis I.

Somerset, Duke of. English title held by the families of Beaufort and Seymour. In 1397 Richard II granted the earldom of Somerset to his kinsman, John Beaufort. John's son, John (d. 1444), was made duke in 1443, as was another son, Edmund, in 1448. Edmund's son Henry was deprived of his titles during the Wars of the Roses.

In 1547 Edward Seymour was made duke of Somerset, but on his attainder in 1552 the title passed into abeyance, being restored in the person of his grandson, William Seymour, husband of Lady Arabella Stuart, in 1660. He was succeeded by his grandson, William,

3rd duke, on whose death without heirs in 1671 it fell to John Seymour, the 2nd duke's youngest son. He also died without issue, and the dukedom devolved upon his cousin Francis, who became 5th duke in 1675. Charles, brother of Francis, became 6th duke in 1678. He was a man of importance at the court of Anne and George I. On the death in 1750 of his son Algernon, 7th duke, the title passed to another branch of the family, from whom subsequent holders of the title descend. *See* Beaufort; Seymour.

Somerset, Edmund Beaufort 2nd Duke of (d. 1455). English statesman and soldier. Son of John, earl of Somerset, and younger brother of John, 1st duke of Somerset, he won military successes in France, succeeded his brother as earl of Somerset, 1444, and as a Beaufort and a favourite of the king was made lieutenant of France, 1447, with the disastrous result to Henry VI that the whole of Normandy was lost by 1450. On his return to England, he was appointed high constable, 1452. Popular discontent was focused on the king's party, and when the duke of York, Somerset's principal opponent, became protector during the king's temporary incapacity, 1453, Somerset was sent to the Tower. After his release in 1455, York raised an army against him and fought the first battle of the Wars of the Roses at St. Albans, May 23, 1455, where Somerset was killed.

Somerset, Edward Seymour, Duke of (c. 1506-1552). English statesman, known as the lord protector Somerset.



Duke of Somerset, English statesman

Ason of Sir John Seymour, his early years were passed at court, and he was attendant on Henry VIII and Wolsey. In 1536 he was made a viscount and in 1537 earl of Hertford, his sister Jane having just been married to the king. In charge of the forces sent to Scotland in 1544, he took Edinburgh, and he gained further military experience on the borders and in France. In 1547, on the accession of Edward VI, Hertford was a member of the council of regency. Almost at once he was chosen protector and made duke of Somerset, and for two years he governed England. As the first Protestant ruler of England, he

subordinated the bishops to the king, issued new liturgies, insisted on the use of English in the churches, and gave parliament control over tithes. His rule saw less religious persecution than any in the past century, although he was a strong Calvinist. Moderation is to be seen also in his attitude towards the people, whom he relieved of oppressive measures by abolishing the ancient treason and heresy laws. Somerset pressed forward the projected marriage between Queen Mary of Scots and Edward VI, but, peaceful methods having failed, he led the army which won the overwhelming victory of Pinkie, Sept. 10, 1547.

But the intrigues of his brother, Sir Thomas Seymour, reflected on the protector; the Scots recovered lost territory; the French pressed on Boulogne; religious reforms offended many, and Somerset's attempts to stop the enclosure of common lands alienated the landowners. Two rebellions broke out in 1549, the second, under Kett, assuming serious proportions. Led by Warwick, the councillors and heads of the army planned the protector's fall, and in Sept., 1549, Somerset surrendered to their demands and was sent to the Tower, but was soon reinstated. Warwick (now duke of Northumberland) received news of a plot against himself to be led by Somerset, and had him again incarcerated in the Tower. Somerset was condemned on a charge of felony and executed on Tower Hill, Jan. 22, 1552. Relentless and rapacious, he had made a huge fortune out of the sale of Church lands and the dissolution of monasteries; but his kindness gave him great popularity among the masses, who protested loudly against his execution. Historically, he stands as the practical consolidator of the Reformation in England.

Somerset, William Seymour, 2nd Duke of (1588-1660). English royalist leader. Grandson of



William Seymour, Duke of Somerset

Edward Seymour, earl of Hertford, 1539-1621, he married Arabella Stuart (q.v.), 1610, and lived in exile in Paris, 1610-16. He inherited the earldom of Hertford, 1621, and was raised to a marquessate, 1640, when he became governor to the prince of Wales. A

royalist general, he captured Hertford, 1642, Cirencester and Bristol, 1643, and was in charge of Oxford during 1645-46. Although attending Charles I during his captivity and trial, he was left at liberty during the Commonwealth, and in 1660 welcomed Charles II at Dover. He received back his forfeited estates, and was created duke of Somerset just before he died, Oct. 24, 1660.

Somerset, ROBERT CARR OR KER, EARL OF (d. 1645). Scottish courtier. Belonging to the family of Ker of Ferniehurst, he came to England in the retinue of James I in 1603, and was one of the king's most favoured minions. Knighted 1607, and made Viscount Rochester 1611, he became the king's private secretary, 1612. His influence brought about the arrest of Sir Thomas Overbury (*q.v.*) in 1613, and he married the countess of Essex, having just been created earl of Somerset and lord treasurer of Scotland. Lord chamberlain, 1614, he quarrelled with James, was accused of poisoning Overbury, and was imprisoned in the Tower, 1616-22. He died in retirement in July, 1645.

Somerset House. British government building in London. The building suffered severely

births, marriages, and deaths may be obtained from Somerset House for 2s. 6d., plus 1s. for search fee, and 1d. stamp.

Somerset House was erected on the site of the palace built, 1549-52, by the lord protector Somerset, and later occupied by the wives of James I, Charles I, and Charles II. Elizabeth lived here before her accession; Inigo Jones died here, 1652; Oliver Cromwell's body lay in state here, 1658.

Somerset Light Infantry. Regiment of the British army. Raised by the earl of Huntingdon in 1685 as the 13th Foot, it first saw active service in Holland. In 1706 it was converted into dragoons, and served as such in Spain; to commemorate the regiment's temporary mounted rôle, the officer's mess jackets are still cut on cavalry pattern. Reformed as infantry in 1710, the Somersets took part in the defence of Gibraltar in 1727, and fought at Dettin-gen and Fontenoy. It was part of the British army that defeated Charles Stuart at Culloden in 1746; in that action all the officers be-



Somerset Light Infantry badge

Infantry, being affiliated to the co. of Somerset in 1881. The regt. fought in the Crimea, the Indian Mutiny, the Zulu War of 1878-79, the Burmese War of 1885-87, and throughout the S. African War.

Sixteen battalions were raised for service in the First Great War and gained the honours: Marne, 1914, '18; Aisne, 1914; Ypres, 1915, '17, '18; Somme, 1916, '18; Albert, 1916, '18; Arras, 1917, '18; Cambrai, 1917, '18; Hindenburg Line; Palestine, 1917, '18; Tigris, 1916. In the Second Great War, battalions fought in N. Africa, Italy, and N.W. Europe. The depot is at Taunton.

Somers Town. District of N.W. London. Part of the met. bor. of St. Pancras (*q.v.*), it was built in the latter part of the 18th century, named after the Somers family, who then owned the freehold, and became a resort of refugees from the French Revolution. Part of the area is covered by the marshalling yards outside the St. Pancras rly. station.

Somervell, SIR ARTHUR (1863-1937). British composer. Born at Windermere, June 5, 1863, he



Sir A. Somervell, British composer

was educated at Uppingham and King's College, Cambridge, and studied music under Stanford and Parry, and in Berlin. During 1893-1901 he taught harmony and counterpoint at the Royal College of Music, then became principal inspector of music to the board of education in London and to the Scottish education department. He was made Mus. Doc. of Cambridge, 1903, and was knighted 1929. Known chiefly for his songs and notably for his settings of lyrics from A Shropshire Lad and Maud, his works also include a Mass in C, 1891; a symphony, 1913; and children's musical playlets. He edited Songs of the Four Nations, a popular collection of folk songs of the British Isles. Somervell died May 2, 1937.

Somervell, SIR DONALD BRADLEY (b. 1889). British lawyer. Born Aug. 24, 1889, he was educated at Harrow and at Magdalen College, Oxford, and became a fellow of All Souls's College, Oxford. He was called to the bar in 1916, and took silk in 1929. In 1931 he was elected Unionist M.P. for Crewe, which he represented until 1945. Solicitor-gen. in the



Somerset House, London. The frontage of the government building on the Victoria Embankment, viewed from Waterloo Bridge

from damage by German bombs dropped in air raids, 1940-41. In quadrangular form and Palladian in style, it is between the Strand and the Victoria Embankment, and was built, 1776-86, by Sir William Chambers, the E. wing being added by Sir Robert Smirke, 1829-34, and the W. wing, 1854, by Sir James Pennethorne. Before 1864 the extensive river front was lapped by the Thames. In the court is a fountain group by John Bacon. Apart from the E. wing, occupied by King's College (*q.v.*), the structure houses the audit, registrar-general's, inland revenue, wills and probate, and other government offices. Wills may be seen on payment of 1s. Certificates of

came casualties and the company commands devolved on the sergeants, from which circumstance arose the existing practice of sergeants wearing their sashes over the left shoulder, as was then customary for officers.

Having been with Abercromby in Egypt, the Somersets proceeded to the W. Indies, and were at the capture of Martinique and Guadeloupe. They took part in the Burmese War of 1824-26; the Afghan War of 1839-42 brought five battle honours. For the heroic defence of Jalalabad, the mural crown and inscription on the regimental badge were granted, together with the secondary title of Prince Albert's. In 1843 they became the 13th Light

national government during 1933-36, then attorney-gen. until 1945, he was knighted 1933 and made a privy councillor 1938. In Churchill's "caretaker" govt. of 1945 he held the office of home secretary. From 1940 to 1946 he was recorder of Kingston-upon-Thames, and in 1946 was appointed a lord justice of appeal.

Somerville. City of Massachusetts, U.S.A., in Middlesex co. It stands on the Mystic river, 2 m. N.W. of Boston, and on the Boston and Maine Rly. Its industries include meat packing, dyeing and bleaching, and desk and picture-frame manufactures. Its large foreign-born population (28 p.c.) is mainly Irish, Italian, and Canadian. Somerville, settled in 1631, held the main powder magazine of the American forces during the Revolutionary War. Pop. (1940) 102,177.

Somerville, EDITH OENONE (1858-1949). Irish novelist and artist. Born in Corfu, she studied art in Paris and London, and became known as collaborator with her cousin "Martin Ross" (q.v.) in a succession of humorous novels of Irish country society and foxhunting, some of which she illustrated. She was master of the West Carbery foxhounds, 1903-08. In an early collaboration of the Somerville and Ross series, *An Irish Cousin*, first pub. 1889, she used the pseudonym of Geilles Herring. Their best known book was *Some Experiences of an Irish R.M.*, 1899. Others were *The Real Charlotte*, 1894; *Some Irish Yesterdays*, 1906; *Further Experiences of an Irish R.M.*, 1908; *Dan Russel, the Fox*, 1911; *In Mr. Knox's Country*, 1915. After the death of Martin Ross, 1915, the two names still appeared over many books written by the survivor. *Strayaways*, 1920, told of the collaboration. Other books by her include *The States though Irish Eyes*, 1931, illus. by herself; *Sarah's Youth*, 1938; *Notions in Garrison*, 1941. She died Oct. 8, 1949.

Somerville, MARY (1780-1872). Scottish writer on science. Born at Jedburgh, Dec. 26, 1780, she was a daughter of Admiral Sir William Fairfax. Her scientific faculties developed in the brilliant intellectual society in which she moved, first in Edinburgh, and, after her second marriage in 1812 to Dr.



Mary Somerville,
Scottish writer

the Society for the Diffusion of Useful Knowledge of Laplace's *Le Mécanique Céleste*, published in 1831 as *The Celestial Mechanism of the Heavens*. This was followed in 1834 by *The Connection of the Physical Sciences*; *Physical Geography*, 1848; and *Molecular and Microscopic Science*, 1869. She died Nov. 28, 1872. *Consult* *Personal Recollections of Mary Somerville*, ed. by her daughter, 1873.

Somerville College. Women's college at Oxford university. It was founded in 1879 as Somerville Hall, in memory of Mary Somerville (v.s.). In that year a building was opened, with residential accommodation, to the W. of Woodstock Road, adjoining the Radcliffe infirmary. The hall was enlarged several times, and in 1894, on the occasion of the opening of a new wing, its name was changed to Somerville College. A library and other buildings were opened in 1904. The Maitland buildings date from 1913, the Penrose block was built in 1927, and the E. quadrangle opened in 1934. In the First Great War the college was used as a military hospital, and in the Second it housed nurses from the Radcliffe infirmary. Dame Emily Penrose and Margery Fry were principals of Somerville, where Vera Brittain, Winifred Holtby, Dorothy L. Sayers, and Barbara Ward were students.

Somma, MONTE. The semi-circular ridge surrounding the present active cone of Vesuvius. It is probably the remains of the large volcano destroyed A.D. 91, and the new cone is accumulating on the floor of an older crater. Somma rings are circular inward-facing, cliff-like features of any volcanoes, the result of the disappearance by explosion or collapse of the upper part of the

William Somerville, in London. She was on intimate terms with the Herschels, Sir Charles Lyell, Sir George Airy, and Dr. Whewell.

Her first considerable publication was a popularisation for

the Society for the Diffusion of Useful Knowledge of Laplace's *Le Mécanique Céleste*, published in 1831 as *The Celestial Mechanism of the Heavens*. This was followed in 1834 by *The Connection of the Physical Sciences*; *Physical Geography*, 1848; and *Molecular and Microscopic Science*, 1869. She died Nov. 28, 1872.

Somme. River of France. It rises near St. Quentin, and flows to the English Channel near St. Valéry. The chief towns on its banks are Péronne, Corbie, Amiens, and Abbeville. Partly canalised, it is connected with the Oise and Schelde by the Somme Canal. Its length is 150 m.

Somme. Dept. of France. Bounded W. by the English Channel, it lies adjacent to the depts. of Pas-de-Calais, Nord, Aisne, Oise, and Seine-Inférieure, and is formed of the old prov. of Picardy and part of Artois. The greater part of the dept. consists of bare, chalky plateau land, traversed by the broad valley of the Somme river, other streams being the Avre, Noye, Selle, Nièvre, Authie, and Bresle. Agriculture is important, cereals and beet being among the crops of a generally fertile soil. In



Somerville College, Oxford. Buildings of the women's college; left, library, etc., opened in 1904; right, the original house

dustries include the manufacture of textiles, woollens, sugar, and paper, brewing, etc., and there are important chalk quarries. Crécy is the chief forest. Amiens is the capital, other towns of note including Abbeville, Doullens, Montdidier, Péronne, Albert, Gamaches, and Picquigny.

The W. half of the dept. suffered much damage during the First Great War, and the two great Somme battles are described in a separate article in pages 7652-55. In the Second Great War, during the 1940 campaign in France, the Germans reached the Somme on May 21. Next day the French destroyed all the bridges across it; but during the first week in June the Germans crossed the river in strength. In the 1944 campaign the Germans made no attempt to hold the line of the river, which was crossed Aug. 31 by the British 2nd army in its spectacular one week's advance from the Seine to Antwerp. Area, 2,443 sq. m. Pop. 467,479.

SOMME: BATTLES OF 1916 & 1918

These two great encounters of the First Great War must always rank among the most significant battles in British and world history. They are described here in the full detail they merit, as are certain other outstanding battles of 1914-18, e.g. Arras; Jutland; Marne; Verdun; Ypres. See the biographies of Foch; Gough; Haig, etc.; also First Great War, Tank

For the summer of 1916 an extensive attack upon the German front on both sides of the Somme was planned. The battle had to be opened a little earlier than had originally been intended

(in order to relieve the pressure on Verdun), before the British preparations were quite complete. The British were to assault from Gommecourt to Hardecourt, with, in the first instance, Rawlinson's 4th army, supported in the extreme N. section of front by divisions of Allenby's 3rd army. S. of Hardecourt the French with their 6th army under Fayolle (directed by Foch) took up the attack on a front extending to Soyecourt. The German staff gives the German force engaged on the first day of battle (July 1) as 12½ divisions. The total British force available at the outset was 26 divisions; the French strength 13; 15 British divisions took part in the initial attack.

Strength of German Fortifications

There was no attempt at surprise, as immense preparations had to be made behind the lines. The Allies at this date had 167 divisions on the French front (French 105, British 56, and Belgians 6) to 122 German divisions, a superiority of about 33 p.c., for the attack on the German fortifications. These were of the most formidable character with wide belts of thick wire, concrete and steel machine-gun emplacements, and deep dug-outs which could only be destroyed by the heaviest projectiles. The operations thus resembled a gigantic siege. For counter-battery work the British heavy artillery was still weak, only possessing 30 long-range 6-in. guns, in addition to heavy howitzers and a few very heavy guns. At the outset almost complete command of the air was secured by the Allied air forces.

The bombardment of the German line began on June 24 and was accompanied by heavy discharges of gas with deadly effect, and by the destruction of most of the German captive balloons, achieved by the air forces. It continued, with some interruptions due to bad weather, till July 1, when at 7.30 a.m. the British and French infantry advanced to the assault.

On the N. section of the front the British attack was repulsed with very heavy (indeed, tragic) loss, particularly from machine-gun fire.

The British right was more successful. Fricourt was enveloped, Mametz entered, and Montauban stormed. The French attack had not been expected by the Germans, and Fayolle's troops reached the outskirts of Hardecourt and Curlu with little loss.

On the following day the battle was resumed; Gough of the 5th army was placed in command of the left, from La Boisselle to Serre, while Rawlinson pressed the attack on the British right between La Boisselle and Montauban, and Fayolle continued his advance in the general direction of Combles. Fricourt fell on the 2nd, and by the 5th the British had secured La Boisselle and reached the outskirts of Contalmaison. All these villages were fortified with extraordinary strength, and held by resolute German troops supplied with abundance of machine guns.

The German first line was now in British hands between La Boisselle and Hardecourt, while the French rapidly advanced and on July 7 took Biaches. Preparations were made for the assault on the second German line, and, as the preliminary, Contalmaison was stormed, after a desperate struggle lasting three days; Mametz wood was cleared; and most of Trônes wood was captured. The British loss in the first fortnight of the battle had been 90,000 men, against a German loss which was probably about the same.

Struggle at Delville Wood

On July 14 at 3.25 a.m. the assault was delivered on the second German line. The two Bazentins with the last part of Trônes wood were carried; and in the next two days Ovillers was seized, Pozières approached, a footing gained in the S. end of Longueval, and in High wood and Delville wood, where the British troops were exposed to gas shelling. A deep salient had been driven into the German front, but for a further successful advance it was necessary to clear the flanks. Unfortunately the weather became rainy and misty, impeding artillery work, which depended entirely on air observation.

On July 18 the Germans violently counter-attacked at Del-

ville wood, where a fearful struggle opened; and they also recovered the N. part of Longueval, which they had momentarily lost. On July 23 Rawlinson attacked from Guillemont to Pozières, while Gough attacked on his left, and after hard fighting Gough carried Pozières on July 26. Delville wood was completely cleared, with the whole of Longueval, by the end of July, after violent fighting, but an attack on Guillemont failed. The British casualties had now risen to 180,000.

Few armies have ever faced such an ordeal; all eye-witnesses are agreed that even at Ypres the misery in the mud was not so great nor the difficulty of maintaining communications so extreme. A serious fact was the heavy consumption of ammunition; though the British ministry of munitions was turning out shells in large numbers, Haig found that in the first 17 days of the battle a supply had been exhausted which he calculated would have lasted a month. On the German side the 1st army had been drawn into the battle and a very large number of divisions had been employed; the losses were heavy, and the exhaustion of the German units extreme.

Guillemont and Thiéval

Bad weather, the need of constructing roads, and shortage of ammunition, to which the explosion of a large dump contributed, prevented large-scale operations being renewed till mid-August, when both British and French carried out a combined attack on Guillemont. As the result, after some days of severe fighting, the station and outskirts of that village were secured, while continuous local attacks were made on the German positions at Thiéval in which important ground was gained. By the end of August the French were in the outskirts of Cléry and were close to Péronne.

At noon on Sept. 3 the British assaulted from Beaumont-Hamel to Guillemont, and the French S.E. of Guillemont, which village was stormed by the British, who also penetrated into Ginchy, whence they were subsequently driven by counter-attacks. The French captured Cléry and extended the attack to the S. by employing the 10th army (Micheler, 13 divisions strong), which took Vermandovillers with little difficulty or loss on Sept. 8. The previous day Ludendorff and Hindenburg, now in complete control of the German army, held a conference at Cambrai at which the Somme position was discussed. Ludendorff states that this was one of the most

critical moments of the war and that the German troops were near the limit of their resistance. Orders were issued for the preparation of the vast fortified zone known to the Allies as the Hindenburg Line, in the event of a German retreat.

On Sept. 15, at 6.20 a.m., another great Allied attack opened, the 4th army attacking between Le Sars and Morval, and the French in the direction of Comblès and S. of that place. For the first time in the war tanks were employed by the British, the effective total of machines at that date being 47. The ground was so shell-torn and unfavourable that these new engines of war had everything against them, and their success was small. But at Flers and Gueudecourt 2 tanks did excellent work, while 7 others gave valuable support elsewhere. No fewer than 9 broke down and 5 were ditched. The general result of the experiment, made prematurely with half-trained crews, was disillusionment.

Results of the Battle

Another general attack was delivered by the Allies on Sept. 25, on a front from Martinpuich to the Somme, with the aid of 13 tanks, and on the following day the front was widened to include Thiépval. After three days of severe fighting, Thiépval, the ridge behind it, Gueudecourt, and Morval were carried, and the British and French secured Comblès, the British alone accounting for 6,000 prisoners with 27 guns, and taking two of the strongest German works, Stuff and Zollern redoubts. In the capture of Gueudecourt remarkable work was done by a tank which, with infantry cooperating, secured a German strong point, and forced the surrender of 370 Germans with a British loss of only 5. Once more the Germans seemed to be on the run, and there were distinct signs of weakness on their front. But again the weather intervened to save them, after Eaucourt had been taken on Oct. 3, in three days of severe fighting.

Le Sars was stormed on Oct. 7, but repeated attempts to carry the Butte de Warlencourt failed with heavy loss, mainly owing to the state of the ground. Men sank up to the knee, and had to shelter in water-logged craters, the construction of trenches being almost impracticable. The French, however, were able to make better progress and, on Oct. 18, carried all the fortified village of Saily-Sailhsel. Down to Oct. 12 they had captured 40,125 prisoners in the battle. In the closing days of Oct., and in early Nov., the British gained ground towards Le Trans-

loy and Grandcourt. German counter-attacks were numerous in these operations, but except on Oct. 23, when the Germans recovered a point of some importance near Le Sars, they were beaten off with heavy loss. During Nov. 11-20 the Allies undertook the operations for the capture of the German positions on the Ancre.

The total British loss in the whole series of battles on the Somme (including the Ancre) was 22,923 officers and 476,553 men, the heaviest incurred in any series of battles on the Western front by any Allied army. The Germans suffered in a lesser degree, losing 444,933 men. The British captured 38,000 prisoners with 125 guns. The Germans engaged in all, on the British front, 95 divisions, or more than half their whole army in the West.

The net results were important. Verdun was relieved, and the Germans were worn down; they did not, for many months, make good their losses in material and their expenditure of ammunition, and they were forced, early in 1917, to fall back from their positions to the Hindenburg Line. The "creeping barrage" was one of the artillery innovations employed by the British in this battle; it had been used by the French, in June, at Verdun. The total territory gained in the actual fighting and the subsequent German retirement, which the Allied advance on the Somme necessitated, was about 1,000 sq. miles, but it had been reduced to the condition of a desert.

A Comparison of Forces

The second battle of the Somme was the first act of Ludendorff's gigantic offensive of the spring of

1918. It was fought with the object of reaching

Amiens and forcing the British and French armies apart. It falls into two sections: the N. attack by the Germans on the British 3rd army (Byng, for which see Arras), and the main attack on the British 5th army (Gough) on the S. section of the front from Gouzeaucourt to Baxis, S. of La Fère. The total front held by the British 5th army was 42 m.; the force for its defence was 11 divisions in line (averaging some 14,000 men), 1 in reserve, 2 under orders of headquarters, not instantly available, and 3 cavalry divisions (which equalled in rifle strength 1 infantry division). Against Gough there stood, ready to advance, 43 German divisions (averaging about 15,000 men, a total of 650,000 men) in front line or immediate reserve with 6,800 guns,

of the 2nd (Marwitz), 18th (Hutier), and 7th (Boehn) German armies, specially trained for attack, reinforced by the pick of the German troops withdrawn from Russia, and assisted by lethal gas-shells of blue and green cross patterns, with which it was hoped to paralyse the British artillery. Byng's army of 17 divisions was stationed N. of Gough, holding a front of 27 m., and against it, on the sector attacked, 25 divisions of the 17th (Below) and 2nd German armies were deployed.

Opening of German Attack

A great offensive was anticipated by the British command, but owing to the absence of a supreme Allied command the arrangements for rapid reinforcement of Gough were defective. No powerful British reserves were near enough. Haig and Pétain, the British and French commanders-in-chief, had agreed that in the event of a German offensive on this portion of the front reinforcements should be provided by the French. Such reinforcements were not immediately available. Violent German demonstrations in the direction of Reims had drawn Pétain's attention to that quarter, and he also feared an offensive at the extreme E. of his front, near the Swiss frontier.

The defences on Gough's front were comparatively weak, as the most dangerous part of that front had been recently taken over from the French, nor had there been the labour available to complete its wiring and entrenchment. The area in the front was organized in three zones; the first or forward zone was to be held by machine-gun posts and redoubts, the garrisons of which were to face annihilation, inflicting first the maximum of loss; in the second, or battle zone, the main force was to engage; the third, or rear zone, had been hastily prepared for a further stand.

The attack was expected in the 5th army on March 14 or 16, from information given by prisoners and deserters. About this date there was heavy gas-shelling by the Germans, and on March 19 the British replied by pouring gas drums into St. Quentin. On the night of March 20 a British trench raid secured definite information that the attack was coming in a few hours, and Haig was warned. Ludendorff that day had been uncertain whether the wind would permit his offensive to open, but before noon it was reported to be not unfavourable, and the order was issued to proceed. Gough's general plan was to fall slowly back, fighting, if he were not quickly reinforced, in order to avoid envelopment and complete destruction.

The night of March 20-21 was unusually quiet, till at 4.40 a.m. of the 21st the Germans opened a terrific bombardment, shelling not only the British front line, but also to a depth of 20 m. behind the front, and in particular concentrating long-range fire on all the roads by which reinforcements could arrive. Unfortunately, none had yet been moved up. Telephonic communication broke down. A dense mist hung over the field, and little or nothing could be seen.

This may have hampered the German attack, though at the time it was thought to have aided Ludendorff. At various points of the line the German infantry storm began at different times—between 7 and 9.30 a.m.—and at one or two points German tanks were used with success. The British infantry, artillery, and machine-guns, though they included many young troops, put up a most gallant and determined resistance, typical of which was the stubborn defence of the 9th division and the stand of the men in the Manchester redoubt.

The Germans advanced, in spite of losses, as far as the Crozat canal, S.W. of St. Quentin; but at most points they were temporarily held, and had British reinforcements been available promptly their attack might have been brought to a standstill. At no point had a break-through occurred. Gough had not received any help from the French or the main British reserves, though he had been permitted to bring up the two divisions (20th and 50th) held back by Haig, one of which reached the field in the evening.

German Advance to St. Quentin

On March 22 mist again hung over the field, and the Germans renewed the attack with masses of men, "leap-frogging" fresh troops through their tired divisions and pushing the British slowly back. Epéhy and Roisel were lost; the Germans, after a furious struggle, crossed the Crozat canal and forced the weak British divisions back before St. Quentin, reaching Vaux. No strong reserves were available on the British side at this point, though the second of Gough's reserve divisions, which had been held back by the British command, had entered the battle in the morning. No French troops had reached the field, but one cavalry division and portions of three infantry divisions were moving towards it. Either destruction or retreat was inevitable, and Gough decided to fall back on positions E. of the Somme.

In view of information as to the

immense German reinforcements moving to support the attack, and in view of the loss of the Crozat canal, early on March 23 Gough decided to continue his retreat to the W. bank of the Somme, a decision which has been criticised.

During the day the Germans fought their way into Ham and Péronne, and followed the British back to the Somme. As the British retreated bridges were as far as possible destroyed, but in a good many cases the German bombardment cut the wires or blew up the charges held ready, and thus the destruction was incomplete. During this day detachments of French troops began to arrive on the battle-front; the French infantry, however, had only 200 rounds of ammunition per man and no artillery. Haig arranged with Pétain that the French should take over the front S. of Péronne. Their intervention only just balanced the fresh reserves which Ludendorff threw in, and could not stabilise the line. Gough's choice was still between annihilation or retirement, and his losses had already been extremely heavy. The situation at the junction of his army with the 3rd (Byng) caused grave anxiety.

German Thrust for Amiens

On March 24 the Germans forced the passage of the Somme between Péronne and Ham. Owing to the dry weather, which had singularly assisted them throughout, the river was no serious obstacle; and farther to the S. they forced back the French and British troops towards Chauny and seized that rly. junction. On this day Pétain issued as a directive order to his forces above all to maintain "the solid connexion of the French armies, and then, if possible, to preserve contact with the British forces," which pointed to an intention to retreat towards Paris and Reims, diverging from the British line of retreat.

On March 25 Haig, fearing that the separation of the British and French armies was only a question of time, asked for 20 French divisions to take up the battle on both sides of the Somme and cover Amiens, on which great rly. junction the Germans were violently thrusting, bombing it constantly and shelling it with their extreme-range naval guns. Gen. Fayolle now assumed charge of the battle S. of the Somme; the French reserves which entered the battle by the close of the 25th were one cavalry and seven infantry divisions, but against these about 10 more German divisions had been thrown in, so that the

numerical balance was still disastrously against the Allies. Over the whole front allied dumps were exploding and allied camps were in flames; on every road multitudes of peasants were in flight, and behind them moved thin, worn screens of British skirmishers and occasional artillery, desperately resisting the furious thrust of the gigantic German force.

On March 25 the Germans entered Bapaume, wresting it from the 3rd army, and that same night, at the S. end of their attack, they carried Noyon, despite a brilliant counter-attack by the 18th division. They already claimed the capture of 45,000 prisoners (many of them, however, wounded) and 750 guns. A gap was opening wide between the main British and French armies, and another gap was opening in the centre of the battle, between the 19th corps (Watts) and the 18th corps (Maxse), both worn and weakened by days of terrific fighting against overwhelming odds. The crisis had come. Gough summoned his chief engineer, Major-Gen. P. G. Grant, and directed him to take every man he could scrape together and hold the ground E. of Amiens. This force, wrongly known as Carey's, from the general who took command of it later, by its bold front deterred the Germans from advancing direct on Amiens.

Loss of Albert

On March 26 the Germans continued their thrusts both to the N. and S. of the Somme. N. of the Somme they captured Albert from the 3rd army and Bray from the 5th army; S. of that river they neared Proyart and captured Lihons, Chaules, and Roye. That day at Doullens a momentous conference took place between M. Clemenceau, Lord Milner, Haig, Pétain, and Foch, as the result of which, at Haig's proposal, Foch was appointed to coordinate the allied movements, though he was not yet given complete control. He immediately directed Débeney to take the 1st French army out of the line and to move with it towards Amiens, and asked both Haig and Pétain to concentrate all efforts on maintaining the united front of their armies.

On March 27 the battle still raged. On the S. front the Germans that day reached Montdidier (*q.v.*), but were checked by the French in an effort to advance between Lassigny and Noyon. In the Allied centre after very fierce fighting they took Proyart, Morcourt, and Framerville. Débeney reported that there was still a gap of ten miles between the British and French. There was

grave risk of an irruption of German cavalry, but, fortunately the German command did not realize its advantage or instantly use it.

British and French reserves were now at last moving swiftly to close the opening, and the Germans had failed to gain the success they desired. Foch issued the order, "Lose not another yard of ground" and Monash, with his Australians, began his deployment, 11 m. E. of Amiens, and with these troops stopped the German advance. By noon he reported that he had the situation well in hand; and Amiens was saved. On March 28 Ludendorff strove to clear the N. flank of his attack by a determined thrust against the 3rd British army and Arras, but this completely failed; and the German offensive towards Amiens gradually died down, though local attacks continued in which some further ground was lost by the British, and Hamel, Mézières, and Dëmuin fell into German hands. By March 29 the Germans had thrown in 100 divisions against 35 British and 15 French divisions. On March 30 Australian, Canadian and British troops counter-attacked, and Dëmuin was recovered. The last German onslaught of importance in this quarter came on April 4-5, when the Germans were repulsed between Hamel and Hangard. The front was stabilised on April 6.

In this battle and the battle of Arras to the end of March, the British loss was estimated at 200,000; the German loss was probably as great in everything but prisoners. Ludendorff states that the desired result was not obtained and that the casualties were severe. In fact, the battle, though a brilliant tactical success for the Germans, was a strategical failure.

A striking memorial to the 73,367 British soldiers who fell in the Somme battles and whose graves are unknown was built at Thiepval (*g.v.*) and unveiled in 1932 by the then prince of Wales.

Sommen. Lake of Sweden. It is 28 m. in length, and stands at an elevation of 480 ft., 15 m. to the E. of Lake Wetter; it has a steamer service from Sommen at the head of the lake.

Somnambulism (Lat. *somnus*, sleep; *ambulare*, to walk). Walking during sleep. This act, very rare in normal individuals, is most often associated with some form of neurotic disturbance. It implies that the muscular apparatus and the part of the brain which controls it are awake while the intellect is deep in unconsciousness.

The sleepwalker avoids pitfalls and collisions, and on waking is unaware of his prowlings. The condition may persist, but a raising of the tone of health, and psychological treatment, should usually result in its disappearance.

Somnath. Ruined town of Junagadh state, Saurashtra, India. On the W. the plain is covered with Mahomedan graves, and on the E. are many Hindu shrines and tombs. It was captured by Mahmud of Ghazni, the Idol-Breaker in 1024. The modern town of Veraval lies to the W., and between the two is a temple of Siva.

Somnus. In Roman mythology, the god of sleep, son of night, and brother of death. In art, sleep and death are represented as two youths holding inverted torches.

Son. River of N.E. India. It rises in the Amarkantak range at the E. end of the Shahpur Hills, Madhya union, and flows N.W. and then N.E. along the S. face of the Kaimur range into the Uttar union, and across Bihar to its junction with the Ganges near Patna. At Dehri it is spanned by one of the longest rly. bridges in the world, 10,044 ft. in length. A dam, 12,500 ft. long, here holds back the water to supply the Son canals which irrigate W. Bihar. The length is 487 m. Drainage area 21,000 sq. m.

Sonant (Lat. *sonans*, sounding). Term used in modern philology to denote the sound which carries the syllabic accent, as *a* in apt. A sonant, therefore, is regarded as the opposite of a consonant, and sonants are vowels, liquids, and nasals. There can only be one sonant in a syllable. See Consonant; Phonetics.

Sonata (Ital. *sonare*, to sound). A composition of importance in music. Originally applied to an instrumental piece only, the term eventually designated a composition comprising several related movements, played by one (or two) performers. The first sonata composer was Andrea Gabrieli, who published his Sonate à 5 instrumenti in 1568. For some time the composers of the 17th and 18th centuries seem to have felt their way towards the evolution of some definite form from the madrigalian type which was their model. These efforts diverged into the Sonata da Camera, or chamber music, and the Sonata da Chiesa, or church music, the former employing, and the latter eschewing, dance forms.

In both the vocal style was gradually superseded by greater free-

dom of melody and rhythm, which became possible through better instrumental technique. Contrast was secured by grouping together different pieces, thus resulting in the suite (*g.v.*). The sonata was the result of a desire to break away from the dance forms of the suite, and the two continued on separate lines, the sonata developing its possibilities and so affecting the course of instrumental music.

Domenico Scarlatti was more homophonic, and in his sonatas he attained a basic design, the principles of which can be traced in later developments. They are constructed on a two-part plan. Their importance lies in their definite rhythm, which thus led up to distinct subjects, evolved by Paradies, C. P. E. Bach, and others, who used subjects contrasted in character and in key. With Haydn sonata form became fixed. Movements, three or four in number, are usually, though not invariably, as follows: (1) A quick movement (sometimes preceded by an introduction); (2) a slow movement; (3) a minuet, scherzo, or something similar; (4) a lively movement. The first and last are in the same key; the others are in related keys.

The plan on which the first movement is written, and sometimes the last also, though this is frequently a rondo (*g.v.*), is in three parts: (1) the enunciation of two subjects, the second being in a related key; (2) the development of this material; and (3) the recapitulation of part one, except that the second subject is now in the primary key. A coda concludes the movement. This is called sonata form, and is the plan of the symphony and most chamber music. With modern composers the tendency is to increase the emotional significance.

A sonatina (Ital., little sonata) is a piece of simpler texture and smaller dimensions than a sonata. See Harmony; Music.

Bibliography. The Art of Music, C. H. H. Parry, 1893; Sonata Form, W. H. Hadow, 1896; Dictionary of Music and Musicians, Sir G. Grove, new ed. 1940.

Sonderbund. German word meaning separate league, applied especially to one formed in 1843 by seven Swiss cantons. Feeling between Roman Catholics and Protestants was very bitter, and the matter came to a head when, in 1841, the great council unconstitutionally voted in favour of suppressing the monasteries in Aargau. This was passed in a

modified form by the diet in 1843. The Roman Catholics protested, and on Sept. 13 seven cantons in which they were dominant formed a Sonderbund; these were Zug, Lucerne, Unterwalden, Fribourg, Uri, Schwyz, and Valais. Disorder broke out in Lucerne, the Sonderbund armed, and in 1847 the diet of the Swiss confederation declared the separate league illegal, and took steps to enforce its authority. The seven cantons were defeated. See Switzerland.

Sondrio. Prov. of Italy, in Lombardy. It is adjacent on the N. to Switzerland, and contains spurs of the Rhaetian and Bergamesque Alps. Its area of 1,233 sq. m. mainly comprises the valley of the Adda. Wine, silk, and chestnuts are the principal products. The town of Sondrio stands on the Mallerio, 25 m. E.N.E. of Colico. Pop. of town, 11,672.

Sonepat. Town of Punjab state, India, in Rohtak dist. Situated on the rly. N. from Delhi, 10 m. W. of the Jumna, it is a local market town and contains two Jain temples. Pop. 15,000.

Sonepur. Town and former state of India. The state, drained by the Mahanadi, was merged in 1948 in the administration of Orissa. Rice, sugar-cane, and cotton are grown. Area 948 sq. m. The town, also called Nijgarh, is at the confluence of the Tel with the Mahanadi. Pop. of former state, 248,873; town, 10,200.

Song. Simultaneous production by the voice of words and musical sounds. Considered as a form, a song consists of words set to music which recurs as many times as there are stanzas, an elementary example being the folk song. From this came the ballad with its simple accompaniment. In the art song the aim is to emphasise the meaning of words by suitable melody, supported by a more elaborate accompaniment, the purpose being to suggest an "atmosphere." Other forms of song are known as scena, aria, etc.

In a literary sense, song often designates verses of a lyrical nature, and in a restricted sense is also applied to the notes of the more vocal birds, such as the nightingale, the thrush, the black-bird, the canary, etc. See Bird Song; Lyric; Minstrel; Music; Singing.

Song Ca, SONG KA, OR SONG KOR. Alternative names for the Hong-Kiang (q.v.) or Red river of Indo-China.

Songhai OR SONRHAI. Negroid people in the middle Niger basin,

S. Sahara. Tall, slender, deep-brown, thin-lipped, straight-nosed, with black, ringlety hair, they present varying intermixtures with Libyan and Arab strains. They now congregate round Gobo and Timbuktu.

Song of Songs (Lat. *Canticum Canticorum*). Hebrew title for the O.T. book, otherwise known as Canticles and The Song of Solomon. See Canticles.

Song of the Shirt, THE. Poem by Thomas Hood, first published in Punch, Christmas, 1843. Suggested by the sight of a widowed needlewoman struggling to keep herself and two children on seven shillings a week, the poem remains unexcelled as a lyric inspired with humanitarian purpose.

Song Thrush OR MAVIS (*Turdus ericetorum*). British song-bird. It is common in most districts, except



Song Thrush or Mavis. Song-bird common throughout most of Britain

the N. of Scotland, and is to be found all the year round, though the majority of the birds migrate in autumn. It builds its nest of grass and twigs, lined with mud and rotten wood, and feeds mainly upon worms, snails, and insects. See Eggs, colour plate; Thrush.

Sonnblick. Meteorological station and observatory in Salzburg, Austria. Established on Mt. Sonnblick in 1886, it stands at an elevation of 10,180 ft., in the Hohe Tauern, N.E. of Lienz in the Puster Thal, and is one of the highest stations in the world.

Sonneberg. Town of Germany, in Thuringia, 9 m. N.E. of Coburg, at the S. of the Thuringian Forest, some 1,300 ft. above sea level. It was long the centre of the German toy industry, with a training school for toymaking and ceramics. Owing to its beautiful surroundings, it had some repute as a holiday resort. Pop. 19,157.

Sonnet (Ital. *sonetto*, a little sound). Form of verse. Invented in Italy in the 13th century, and perfected by Dante and Petrarch, the regular or Petrarchan sonnet consists of 14 iambic lines of 10 or 11 syllables, the first eight lines,

or octave, generally devoted to the exposition of the theme, having the rhyme-scheme *abbaabba*; and the last six, or sestet, containing the application of the idea, with two or three rhymes variously arranged, a closing couplet being avoided. In England, from Surrey to Milton, many irregular forms were used, the chief being the Shakespearian sonnet, rhyming *ababcdcdefeggg*. Milton used the Petrarchan form, but ignored the break after the eighth line. Most of the great poets of the 19th century were attracted to the sonnet, especially Wordsworth who wrote some hundreds. E. B. Browning and D. G. Rossetti produced their best work in this form, and a later specialist was Lord Alfred Douglas. Longfellow was an early exponent of the form in America.

Sonora. Maritime state of N.W. Mexico. Bounded to the N. by the U.S.A. and W. by the Gulf of California, it is mountainous in the E. and has an area of 70,477 sq. m. It is rich in minerals, silver, gold, copper, coal, and iron being worked, and cereals, cotton, sugar, and tobacco are cultivated. Hermosillo is the capital of the state. Pop. 364,176.

Sonoran. Family of American Indian languages, spoken mostly in Chihuahua and Sonora, but also in Arizona.

Sonsonate. Dept. and town of Salvador. The dept. is low-lying near the Pacific Ocean and elevated inland. Sugar, coffee, tobacco, fruit, and cabinet woods are the chief products. Area, 540 sq. m. Pop. est. 100,000.

The town, capital of the dept., is 32 m. W. of San Salvador, and is connected by rly. with Acajutla. It was founded in 1524 by Spaniards under Pedro de Alvarado. Pop. 23,559.

Soo Canals. Popular variant of the Sault Sainte-Marie (q.v.) ship canals of N. America.



Sonnblick, Austria. Meteorological station on the top of the mountain

Soong. Name of an influential Chinese family. Soong Yao-ju (1863-1918), who sailed to America as a boy, was converted to Christianity by a sea captain, Charles Jones, and at baptism took the names of his benefactor. Returning to China in 1886 he was first a preacher and teacher, marrying a co-worker, then an agent for foreign machinery, and finally, from 1895, a follower and helper of Sun Yat-sen (*q.v.*). He set up a printing press at Shanghai which became one of the world's largest. It printed Bibles openly and revolutionary literature in secret.

Of his six children, the four eldest were educated in America. The eldest daughter Eling (b. 1890) returned to Shanghai in 1909, and married in 1913 Kung Hsiang-hi, a 75th descendant of Confucius. Kung founded the Oberlin Shansi memorial college at Shansi and was its first principal. Between 1926 and 1938 he held several important govt. offices, including those of minister of industry and minister of finance. C. J. Soong's eldest son Tse-ven (b. 1891) returned to China in 1917 and became president of the central bank, then minister of finance, 1925-27; vice-pres. of the executive yuan, 1930-44; foreign minister, 1941-44 (attending the first Quebec conference, 1943); and president of the executive yuan (prime minister), 1944-47, representing China at the San Francisco conference, 1945. In 1947 he became governor of Kwantung. Chingling, the second daughter, who returned to China in 1913, became secretary to Sun Yat-sen, whom she married in 1914, against the wishes of her family; she was vice-president of the Communist govt. set up in Peking, 1949. The third daughter, returning in 1917, married Chiang Kai-shek in 1927; see Chiang Kai-shek, Mme.

Soot. Black carbonaceous deposit due to imperfect combustion of many substances, *e.g.* coal. Soot consists mainly of carbon, tar, and ash or mineral matter, together with small quantities of sulphur and nitrogen compounds, and is frequently acidic. Analyses show great variations in composition. Soot is employed as a manure on account of the nitrogen it contains. Various estimates have been made of the quantity of atmospheric soot. The soot-fall in the built-up area of London (425 sq. m.) was estimated in 1947 to be 92,400 tons annually. See Pollution.

Soothsayer (A.S. *sóth*, truth). One who professes, by supernatural

means, to reveal the future or any unknown fact. The word is virtually synonymous with diviner, though applied more especially to those who utter predictions in a state of trance or ecstasy, or by interpreting dreams or subjective impressions, without the aid of physical objects. See Divination; Magic; Oracle; Prophecy; Sibyl.

Sophia (Gr. *sophos*). Word meaning wisdom. The term Hagia Sophia, or the Holy Wisdom, is used for the supreme wisdom. Many churches are dedicated to it, the most notable being that at Istanbul. The word is also a feminine Christian name. See Istanbul; Saint Sophia.

Sophia (1630-1714). Electress of Hanover. The twelfth child of the Elector Palatine and his wife



Sophia,
Electress of Hanover

Elizabeth, daughter of James I, she was born at The Hague, when her parents were in exile, Oct. 14, 1630. She married in 1658 Ernest Augustus, a duke of Brunswick, who, in 1692, became elector of Hanover. Neither William III nor Anne, who would succeed him, had children living, and in its anxiety to exclude the R.C. descendants of Charles I, parliament settled the crown on Sophia and her heirs, being Protestant. She did not live to become queen, as she died, June 8, 1714, only a few weeks before Anne. George I was the eldest son of her large family. An unusually intelligent woman, she took a keen interest in the last in the affairs of England. See Settlement, Act of; consult S. of Hanover and Her Times, F. E. Bailey, 1936.

Sophia Dorothea (1666-1726). German princess. Born Sept. 15, 1666, daughter of George William of Brunswick-Lüneburg, she was compelled for family reasons to marry, Nov. 21, 1682, her cousin George, the future elector of Hanover and king of England. She bore her husband two children, George, afterwards George II of England, and Sophia Dorothea, who married Frederick William I of Prussia. The re-



Sophia Dorothea,
German princess

lations between Sophia Dorothea and her husband became worse as time went on. She was accused by her enemies of criminal intrigue with Philipp von Königsmark, who vanished mysteriously and was probably murdered in the palace at Hanover on July 1, 1694. Divorced and imprisoned that year at Ahlden, near Celle, she lived there until her death on Nov. 3, 1726.

Sophister or **SOPHOMORE** (Gr. *sophos*, wise). In various universities, term commonly applied to undergraduates of more than one year's standing.

Sophists (Gr. *sophistēs*, wise man). Class of teachers in Greece, first prominent in the 5th century B.C. The general progress of culture, mistrust of the traditional beliefs, democracy's newly found consciousness of its power, the growing importance of oratory as an aid to personal ambition, had created a demand for competent teachers. This demand was met by the sophists, professors of wisdom, who declared themselves ready to give instruction in all possible branches of knowledge, and especially to fit their pupils for practical life. These sophists are the representatives of the Greek illumination, an intellectual movement reflecting the altered social, political, and religious conditions of Greek life. They are the apostles of subjectivity, of the doctrine that objective truth does not exist.

The earliest sophists were Protagoras of Abdera (*q.v.*), the first to ask a fee for teaching, and Gorgias of Leontini (*q.v.*). Later sophists, *e.g.* Critias the tyrant, who described religion as the invention of politicians, were advanced free-thinkers. Hippias of Elis and Prodicus of Ceos have a better reputation. Later generations of sophists, by their greed of money and their attacks on family life and all social, religious, and political institutions, drew upon themselves the odium of the public. In spite of these defects, the sophists brought a mass of general knowledge within reach of the people, and in particular rendered great services in the formation of Attic prose. They were the first to pay attention to style, rhythm, and rhetoric as an art. Attic oratory begins with them; Antiphon and Isocrates are their literary descendants. See Greek Literature; Hippias; Prodicus.

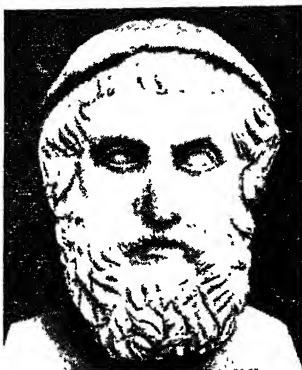
Sophocles (495-405 B.C.). Athenian tragic dramatist. Born at Colonus, near Athens, the son of a well-to-do worker in metals,

Sophocles received the usual education of an Athenian gentleman. At the age of 15 he was chosen for his grace and beauty to lead the chorus which sang the song of triumph in celebration of the victory over the Persians off Salamis in 480 B.C. He won his first prize for tragedy in 468, Aeschylus being placed second. For the rest of his long life he was chief favourite on the Athenian stage, winning the first prize 20 times. In 440 B.C. he was appointed one of the ten generals in the campaign against Samos, but Pericles, the Athenian leader, employed the poet chiefly in connexion with the work of supply. There is a story that towards the end of his life one of Sophocles' sons, Iophon, brought an action against his father alleging that he was of unsound mind, but that the case was brought to an abrupt conclusion by the aged poet's reciting a magnificent choral ode from his latest tragedy.

Sophocles wrote about 130 plays, but only seven are extant. These were probably produced in the following order: Antigone, Electra, Trachiniae, Oedipus Tyrannus, Ajax, Philoctetes, Oedipus Coloneus, the best known being the first, fourth, and seventh, which deal with the hereditary curse on the house of Oedipus (*q.v.*). Sophocles, however, intensifies and humanises tragedy by insisting on the elements in it which are due to man's arrogance and self-will, and to the moral conflict between human wills. He teaches the wisdom of self-restraint, and acceptance of divine and eternal law. He rises above the traditional religion of Aeschylus, but avoids what was considered the irreverent realism and scepticism of Euripides.

The plays of Sophocles, typical of the Greek spirit in the age of Pericles, are marvels of harmony, proportion, and restraint, above all the Oedipus Tyrannus, which in plot and construction is the masterpiece of Greek tragedy. By introducing a third actor, and diminishing the rôle of the chorus, Sophocles was a great reformer of dramatic technique. *See* Antigone; Drama; Electra; Greek Literature; Oedipus; Tragedy; *consult also* Works, ed. L. Campbell, 1871-81; Works, by R. C. Jebb, 1883-96; trans. F. Storr in the Loeb Classical Library, 1912; History of Ancient Greek Literature, G. Murray, 1897; Religious Teachers of Greece, J. Adams, 1909.

Sophonisba (d. c. 203 B.C.). Daughter of the Carthaginian general Hasdrubal, son of Gisco.

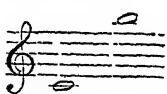


Sophocles, the Athenian dramatist

Her husband Syphax, king of W. Numidia, who sided with Carthage in the second Punic War, was defeated in 203 B.C. by another Numidian king, his neighbour Masinissa, an ally of the Romans. Sophonisba passed into the hands of the victor, who made her his wife, but was ordered by Scipio, the Roman general, to give her up. Masinissa, however, had become much attached to her, and sent her poison with which she put an end to her life. Sophonisba is the subject of tragedies by Marston, 1602; James Thomson, 1729; Corneille, 1663; Alfieri, 1783; and others. *See* Masinissa.

Sophora. Genus of trees, shrubs, and a few herbs belonging to the family Leguminosae. There are about 25 species, natives of the warmer regions of Asia and America. The leaves are broken up into two rows of paired leaflets, and the purple, yellow, or cream-coloured, pea-like flowers are borne in racemes or panicles. The best known species is *S. japonica*, the Chinese pagoda tree. *S. tetraptera*, a yellow-flowered species from New Zealand, is only half-hardy in Britain, and will only grow when trained against a warm sheltering wall. *S. sericea*, native of the North American prairies, is a perennial herb, covered with silky down, and having white flowers. *See* Pagoda Tree.

Soprano (low Lat. *superanus*, sovereign). The highest kind of human voice. Its compass is shown thus:



but exceptional voices can go nearly an octave higher. The classification, however, depends as much upon the quality, which is of light timbre, as upon the range. It belongs naturally to

women and boys, but during the 17th and 18th centuries in particular, it was also possessed by artificial sopranos (*castrati*), who united with the lung power of men the timbre of the boy's voice. *See* Singing.

Sopron or ÖDENBURG. Town and co. in the extreme N.W. of Hungary. The town lies W. of the Ferto and is a rly. junction for Vienna, 51 m. N.W. Its chief buildings are the Dominican church of the 17th century, Benedictine church of the 13th century, town hall, which houses a museum, and town tower, 200 ft. high. The site has been identified as that of the Roman Sopronium. Pop. est. 35,000.

Sopwith, THOMAS OCTAVE MURDOCH (b. 1888). British airman, yachtsman, and inventor. Studying at Seafield engineering college, he became interested in aeroplane designing, and in 1910 won the Baron de Forest £4,000 prize for a flight from England to the Continent. Then he founded his own aviation and engineering company at Kingston-on-Thames, where he designed and built such aircraft as the single-seater Pup and a triplane, both used in the First Great War. In turn managing director of the Hawker Engineering co., director of Hawker Aircraft Ltd., and chairman of Hawker Siddeley Aircraft Ltd., he helped to evolve aircraft outstanding in the Second Great War—the Hurricane, Typhoon, and Tempest. In 1934 Sopwith challenged with his yacht Endeavour for the America's Cup, but was beaten by H. Vanderbilt's Rainbow.

Sora. City of Italy, in the prov. of Frosinone. It stands on the Liris (Garigliano), 62 m. E.S.E. of Rome. Woollens and paper are manufactured; there is some trade in wine, olive oil, fruit, and cattle. Originally a Volscian town, Sora was colonised by the Romans in 303 B.C., and has remains of its old walls, and ruins of medieval castles on an eminence above the town.

Sorata. Andean mt. in the dept. of La Paz, Bolivia. It stands E. of Lake Titicaca and rises to the peak of Illampu to the highest point in the country, 21,490 ft. Sorata is also the name of a health resort on the lake at the base of the mt. Pop. 3,500.



T. O. M. Sopwith, British airman

Sorau (Pol. Zary). Town 60 m. S.S.E. of Frankfort-on-Oder, near the boundary of Brandenburg and Silesia, in the area of Germany placed under Polish rule by the Potsdam agreement, 1945. With urban rights from 1260, it was governed by counts, but fell to Saxony in 1765 and to Prussia in 1815. There are a 13th century castle, three Gothic churches, and a palace of 1710-16. Normally there are glass, porcelain, and textile industries. Pop. 20,134.

Sorauren, BATTLE OF. Engagement in the Peninsular War, July 28, 1813. The fiercest of the Pyrenees battles, it was the culmination of Soult's advance to relieve San Sebastian. Wellington's allied forces numbered some 12,000, and Soult attacked with double that number. The French, unable to move the British from their lines, were forced to withdraw. Two days later another engagement took place at Sorauren as Wellington was driving Soult back across the Pyrenees. See Peninsular War.

Sorbonne. French centre of education. It was founded by Robert de Sorbonne in 1252 as a hostel for poor students of the university of Paris belonging to

secured the imprisonment, and finally the execution, of Étienne Dolet, the Lyons printer, on grounds of heresy and contumacy, it had previously encouraged other early printers, including Ulric Gering (Quering), until the flood of new books threatened to get beyond control. Many world-famous authors, from Rabelais to Rousseau, fell under the ban of the Sorbonne, which supported the Jansenists against the Jesuits, while it was the favourite butt of all the writers who desired emancipation from the rigid control of ecclesiastical authority.

Among the benefactors of the Sorbonne was Richelieu, who completed his theological training there, after being consecrated by the bishop of Luçon. In 1629 he erected new buildings for the Sorbonne, which remained in use until the vast reconstruction scheme of 1885 onwards. The only part of the 17th century buildings now standing is the church, where the cardinal was buried. Restored by Napoleon in 1808, the Sorbonne since 1896 has been the university of Paris. The New Sorbonne is housed in a magnificent range of buildings, with a frontage of 270 yards. It still attracts numbers of foreign students.

Sorcerer, THE.

Comic opera in two acts by Gilbert with music by Sullivan. Produced at the Opéra Comique, London, Nov. 17, 1877, it was the earliest full-length opera of the famous collaboration, though shorter than any which followed.

The setting is a rural village and the theme is the

action of a love philtre. The most memorable song is the patter-song in which the sorcerer, John Wellington Wells, introduces himself to the company.

Sorcery (Lat. *sors*, a lot). Originally a simple form of divination by casting lots. The term later came to signify the exercise of supernatural powers by a magician over spiritual agencies. It was also applied to the practice of magic generally. Up to about the middle of the 18th century, sorcery in England was a crime punishable with death. See Asia; Divination; Lot; Magic; Witchcraft.

Sordello (13th century). Italian troubadour. He is supposed to

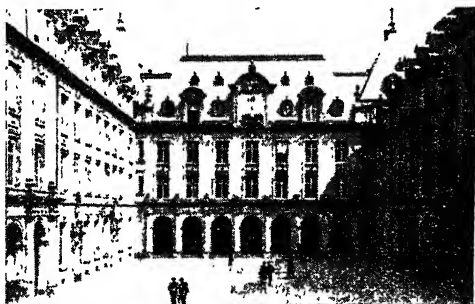
have been born at Goïto, near Mantua, and after some rather scandalous behaviour to have taken refuge, about 1230, at the court of Charles of Anjou, and to have died in Provence about forty years later. Several of his love songs and political poems have been preserved. They were collected and published with a biographical sketch in Italian by C. de Lollis, 1896. There are several references to him in Dante's *Purgatorio*; and Robert Browning made Sordello the subject of one of his earliest long poems, 1840.

Sorel. Town of Quebec, Canada, capital of Richelieu county. It stands at the junction of the Richelieu with the St. Lawrence, 51 m. N.E. of Montreal, on the C.N.R., with ferry connexion to the C.P.R. There are shipbuilding yards and sawmills, and manufactures of agricultural implements, wooden goods, bricks, etc. Sorel was founded in 1665, one of the oldest towns in Canada. Pop. 12,251.

Sorel, AGNES (1409-50). Mistress of Charles VII of France. Of good family, she was born at Fromenteau in Touraine, and entered the service of the duchess of Anjou, who in 1431 brought her to the royal court. She attracted the notice of Charles, and in 1444 became his mistress. She received great gifts from the king and remained his companion until her sudden death, which the dauphin, afterwards Louis IX, was said to have caused. See Orléans; consult *The Lady of Beauty*, J. D'Orliac, 1933.

Sorel, ALBERT (1842-1906). French historian. Born at Honfleur, Aug. 13, 1842, he was educated in Paris and in Germany. Abandoning the law, he became a civil servant 1866-75, but his main interests were literary, and he was soon at work on volumes of prose and verse. His life-work, however, was done in the domain of history. He had already lectured on diplomatic history at the college of political science when the first volume of his *Europe* and the French Revolution appeared in 1885. In 1904 he published the eighth volume of this great work. He died in Paris, June 29, 1906.

Sorel, CÉCILE (b. 1875). French actress. Born in Paris, Sept. 7, 1875, she first appeared at the



Sorbonne, Paris. A view of the courtyard of the University of Paris

various nations, under the title of the community of poor masters. The Sorbonne soon gained a fame and authority in theological matters, which lasted until its temporary suppression at the Revolution. Royal patronage and support secured a house for the new focus of learning in 1257, in the Latin quarter of Paris, where the present institution is to be found, and the name Sorbonne was for centuries a rallying cry for all the anti-liberal forces of the Church, and bitterly hated by the friends of the Reformation and the new learning.

The faculty of the Sorbonne soon became all-powerful in its decisions, and it is curious that while it



Agnes Sorel, Mistress of Charles VII of France

Eden Theatre there, establishing her reputation in classic drama. She acted at the Odéon, 1893-1901, and first appeared at the Comédie Française, 1901. A supreme exponent of comedy, she achieved an international reputation, frequently acting in Molière. She married the Comte de Ségur.

Sorghum. Genus of grasses of the family Gramineae. They are natives of the warmer regions, with the flowers in panicles and each glume containing two flowers. The principal species is Indian millet (*S. vulgare*). There is a variety *saccharatum* of this species, from whose stems a syrupy sugar is obtained. *S. halepense*, with broad, white-ribbed leaves, is often cultivated for ornament in British gardens, its loose purple panicle attaining a height between 2 ft. and 10 ft. See Indian Millet.

Soria. Prov. of N. Spain. It occupies 3,977 sq. m. between the Sierras de Guadarrama, de la Demanda, and Moncayo. A mountain-bordered tableland in the basin of the Douro, it has a cold and dry climate. The snow-capped mountains are forested with oak and beech on the lower slopes. Lumbering, charcoal-burning, and working of asphalt and salt are main occupations. Pop. 162,218.

Soria. Town of Spain, capital of Soria prov. Situated 155 m. N.E. of Madrid, the town, which has a mediæval aspect retaining parts of the 13th century walls and several ancient palaces, stands at an elevation of 3,465 ft. on a bleak plateau. Here the Douro is crossed by a massive bridge. The collegiate church of San Pedro and a ruined castle are the most notable edifices. Flour mills, tanneries, potteries, linen, and chocolate factories are the principal industrial establishments, while leather, fruit, timber, and wool are the main articles of trade. The site of the ancient Numantia is 3 m. N. Pop. 7,500.

Soriano. Dept. of Uruguay. It is bounded W. by the Uruguay river and N. by the Rio Negro, and has an area of 3,561 sq. m. Stock-rearing is the principal occupation. Mercedes is the capital. Pop. 93,490.

Sorites (Gr. *sōros*, heap). In logic, a series of syllogisms in which the predicate of each proposition is the subject of the following proposition, the conclusion containing the subject of the first, and the predicate of the last proposition; the soul is a thinking agent; a thinking agent is indivisible; that which is indivisible is indestructible; therefore the soul

is indestructible. See Logic; Syllogism. Pron. sō-ri-teez.

Sorø. Town of Denmark. It stands on Lake Sorø, in Zealand, 49 m. S.W. of Copenhagen and 20 m. E.N.E. of Korsør, with both of which towns it has rly. connexion. The tombs of several Danish kings and of Holberg, the dramatist, are in the church attached to its famous Cistercian monastery. Sorø academy, founded 1586, is one of the wealthiest institutions of its kind in Europe.

Sorø or **Soroy.** Island of Norway, lying off the N.W. coast, some 20 m. N. of the mouth of Alten Fjord. Its greatest width is about 40 m. The pop. of about 2,500, mostly engaged in fishing, suffered extreme hardship at the hands of the German forces during the Second Great War. In Nov., 1944, they were ordered to evacuate the island. All houses, animals, and food stocks were destroyed, and over 1,000 men and women were removed for forced labour. In 1945 it was announced that 525 civilians had been rescued from the island in three Royal Navy destroyers and the Canadian destroyer Sioux.

Sorocaba. City in the state of São Paulo, Brazil, one of the chief industrial centres of the republic, lying 68 m. W. of São Paulo. Besides having large cotton and silk weaving and spinning mills, it produces alcohol, boots and shoes, cement, fertilisers, and wines. There are rly. workshops, orange groves, and packing plants, all served by hydro-electric power. The district is an important cotton-growing centre. Rly. connects the city with São Paulo. Pop. 42,000.

Sorolla y Bastida, JOAQUIN (1863-1923). A Spanish painter. Born at Valencia, Feb. 27, 1863, he studied art under Pradilla and in Paris. In 1900 he was awarded the grand prix of the Paris Salon, and soon came to be recognized as the foremost painter of Spain. A brilliant Impressionist, he produced an immense number of pictures, chiefly landscapes and marine pieces with groups of fishermen and children. He also painted portraits of the Spanish royal family and others. He died Aug. 10, 1923. See Spain: Art.

Soron. Town of the United Provinces of India, in the Etah division. Situated in the N. of the div. near the Ganges, it is a pilgrim resort and contains the temple of Sita Ramji and the tomb of Sheik Jamal. Pop. 13,000.

Soroptimists. Feminine counterpart of the Rotarians. This body of business and professional

women with Rotary ideals of public service was founded at Oakland, Calif., in 1923, the name indicating literally "sisterhood of the best." There are numerous Soroptimist clubs in Great Britain with membership exceeding 6,000. Weekly, fortnightly, or monthly meetings are held by British Soroptimists to hear addresses and conduct discussions, and an annual summer conference reports progress. An international conference takes place every four years.

Sorority. Society or club of students in a women's college in the U.S.A., corresponding to a fraternity in a men's college and with similar objects. It may be either nationally chartered or a single chapter in one college. In 1948 there were 29 general sororities, with memberships from 200 to over 43,000. The earliest was founded in 1851. There were also 26 professional sororities, confined to members of professions, such as architecture and music, and six education sororities. Each society is denoted by two or three letters of the Greek alphabet.

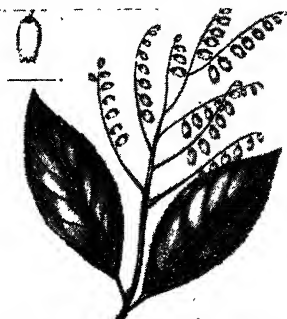
Sorpe Dam. Structure in the Ruhr valley, Germany, supplying hydro-electric power to surrounding districts. It was attacked in the Second Great War by R.A.F. bombers for the first time on May 17, 1943, when the Mohne and Eder dams were breached. It withstood this attack, and also a 12,000-lb. armour-piercing bomb which struck it when dropped by the R.A.F. on Oct. 15, 1944.

Sorrel (*Rumex*). Large genus of biennial and perennial herbs of the family Polygonaceae, including the dock (*g.v.*). The two smallest British species are known as sorrels, and are weeds in every meadow and pasture. Their leaves are edible, have a pleasant acid flavour, and are used as a salad ingredient. For this purpose seed should be sown in spring in rich loam, and the plants thinned out

about 2 months afterwards to a distance of 6 ins. apart every way. Sorrel may be increased either by seed or by the division of the roots in March. The British sorrels are *R. acetosa* and *R. acetosella*; an Italian species, *R. patientia*, is sometimes grown for use as a herb.



Sorrel. Leaves, flowers, and stems of *Rumex acetosa*



Sorrel Tree. Flowerspray and lanceolate leaves; inset, single flower

Sorrel Tree OR **SOURWOOD** (*Oxydendron arboreum*). Tree of the family Ericaceae, indigenous to N.E. America. It has oblong lanceolate leaves and clustered sprays of white flowers. The names refer to the acid taste of the leaves.

Sorrento (anc. *Surrentum*). City of Italy, in Naples prov. It is a tourist resort picturesquely situated on a promontory between the Bays of Naples and Salerno, 16 m. S.S.E. of Naples and 10 m. by road S.W. of Castellammare. It contains ruins of Roman temples, a cathedral, and a seminary. Torquato Tasso, a native, is commemorated by a marble statue. Sorrento wine is celebrated. The Allied 5th Army gained possession from the Germans of Sorrento, undamaged, Sept. 28, 1943. Pop. (est.) 7,000.

Sortes Virgilianae (Lat. *sorts*, a lot). Practice of divination by opening a sacred book and taking the first words on which the eye falls as a supernatural indication or warning. The Sibylline books were used for this purpose by the Romans, and after their destruction were succeeded by Virgil's Aeneid, whence the term is derived. See Divination; Lot.

Sör-Trøndelag. Fylke or co. of Norway. It stretches S. from Trondhjem Fjord to the Dovrefeld lying between the co. of More and Sweden. Trondhjem and Røros are the chief towns. Its area is 7,241 sq. m. Pop. 192,151.

S O S. Morse signal issued by vessels in distress, usually by radio. The letters are not abbreviations of words, but are used because they are the most distinctive in the Morse code and the easiest to transmit (three short signals, three long, three short). At sea normal radio traffic ceases for a specified period each hour to enable ships to listen for distress messages, while the signal itself usually can be detected when superimposed on traffic using normal

ship's wavelengths. On vessels which do not maintain constant radio watch, reception of the Morse code actuates an automatic device on the radio receiver and rings a bell on the bridge and in the operator's quarters.

The term SOS is also used for an emergency message broadcast by the B.B.C. The first of these was sent out on Sept. 10, 1923, and they now average 1,000 a year. Messages are restricted to two types: those requesting relatives to go to a sick person, broadcast only on a medical certificate and when all other means of communication have failed; and police messages calling for witnesses of accidents or announcing the loss of dangerous drugs.

Sosnowiec OR **SOSNOVETS**. Industrial town in Polish Silesia. It lies 7 m. E. of Katowice, with which there is rly. connexion, in the most populous area of Poland, and before the Second Great War had some 130,000 inhabitants, engaged chiefly at iron and chemical works and cotton mills. Its river is the Brinitza.

Soteriology (Gr. *soteria*, safety; *logos*, knowledge). In Christian theology, term for the science or doctrine which treats of salvation through Jesus Christ. It is to be distinguished from Christology (*q.v.*), which is concerned with the person of the Redeemer. See Salvation.

Sotheby's. London firm of auctioneers of books and works of art. Founded by Samuel Baker, in York Street, Covent Garden, where its first auction was held Jan. 7, 1744, and carried on by his nephew, John Sotheby, the firm became known later as Sotheby, Wilkinson and Hodge, and its catalogues have included many famous collections. After nearly a century of occupation, the rooms in Wellington Street, Strand, the scene of a destructive fire June 29, 1865, were given up May 25, 1917, and new premises were opened on the site of the old Doré Gallery in Bond Street.

Sothern, EDWARD ASKEW (1826-81). British actor, born April 1, 1826, in Liverpool. He made no mark as an actor until the production of Tom Taylor's *Our American Cousin*, in New York, May 12, 1858. In this he created the part of Lord Dundreary, which became the star part in the play. On Nov. 11, 1861, he produced the comedy at the Haymarket Theatre, London, where it ran for 496 consecutive nights. Sothern's next greatest London success was

the lead in T. W. Robertson's *David Garrick*, 1864. He died Jan. 21, 1881. See Dundreary.

Sothis. Greek form of the ancient Egyptian name of Sirius, the dog-star. Its rising with the sun on July 20, when the Nile inundation began, gave it importance in the Egyptian calendar. As the solar or sothic year comprises nearly 365½ days, and the civil year reckoned 365 days only, the calendar—until Augustus introduced leap year—receded one day every four years, and a sothic period, consisting of 1,460 years, elapsed before the calendar coincided again.

Soto, HERNANDO OR FERNANDO DE (c. 1496-1542). Spanish explorer. He was born at Jeréz de los Caballeros, Estremadura. In 1519 he joined an expedition to Darien, and in 1524 he helped to conquer Nicaragua, afterwards sailing along the coast of Central America. In 1532 he brought reinforcements to Pizarro in Peru, where he took a prominent part in the conquest. Charles V appointing de Soto governor of Cuba and Florida, he sailed thither on an expedition in search of gold in 1539, and for nearly four years explored the country between the Atlantic and the lower Mississippi, crossing that river in 1541, and reaching Arkansas. He died of fever on the banks of the Mississippi in May or June, 1542. *Consuli* Life, R. B. Cunninghame Graham, 1903; De Soto and the Conquistadores, T. Maynard, 1930.

Sou. Obsolete French copper coin, the twentieth part of a livre. It ceased to be coined when the decimal coinage was introduced, but gives its name to the present 5-centime piece.

Soubise. Name of a noble French family. It was allied to the family of Rohan by the marriage of a female representative, Catherine de Parthenay, in 1575. Among its members was Henri, duc de Rohan (*q.v.*). His brother Benjamin (c. 1583-1642) fought under Maurice of Nassau, and was a leading Huguenot. He fought against Louis XIII and fled to England, 1622, afterwards commanding a small fleet against Louis, and aiding Buckingham in his attempt to save La Rochelle. He died in London, Oct. 9, 1642. Charles de Rohan, prince de Soubise (1715-87), fought under Louis XV, 1744-48, was defeated by Frederick II at Rossbach, 1757, and became marshal in 1758. He was a lifelong friend of Louis XV, and with his death, July 4, 1787, the line be-

came extinct. The hôtel Soubise, Paris, acquired by this prince in 1742, was occupied by the national archives after 1808.

Souchez. Village and river of France. The former is in the dept. of Pas-de-Calais, about $4\frac{1}{2}$ m. S.W. of Lens on the Béthune-Arras road and situated between the ridges of Vimy (*q.v.*) and Notre Dame de Lorette. The river, partly canalised, is known as the Deûle in its lower reaches. The Souchez dist. was fiercely contested in the First Great War, and this and other villages were obliterated. It was the centre of severe fighting between the French and Germans, May-July, 1915. In 1922 the village was rebuilt, partly by funds subscribed by the borough of Kensington, London.

Soufflé (Fr. *souffler*, to puff or breathe). Very light dish of eggs and some farinaceous substance, such as flour or potatoes. A soufflé must be served immediately the heat has raised it high above the basin in which it has been cooked, or it will become heavy.

Soul. Mental principle regarded as a personal entity separate from the body, manifested in individual mental life. It is not the mind, but that which thinks and wills. In psychological language, however, it is generally identified with the mind. Theologically, although strictly distinct from spirit, it commonly denotes a simple, immaterial, immortal substance in man, the origin of all his mental operations and desires, whereby he is distinguished from other animals.

Primitive mankind regarded all things in nature as endowed with souls, partaking of the nature of breath or refined substances. This view was subsequently limited to the animal kingdom, although even in recent times souls have been ascribed to plants. It was at first believed that the soul was material, and perished with the body. Plato put forward the idea that it was immaterial, immortal, and tripartite, only temporarily connected with the body. Aristotle assumed three different kinds of soul—the nutrient (the vital principle of plants), the sentient (animal), the thinking (man). The soul was not itself a separate entity.

During the Middle Ages the Platonic and Aristotelian theories, modified in order to reconcile them with Christianity, were equally supported, until Aristotelian monism gave way to the dualism of Descartes. He held body and soul to be essentially different beings, the essence of the one being ex-

tension and of the other thought, whose combination in man was due to divine assistance. Locke assumed the soul to be a sheet of blank paper ready to receive sensations. Leibniz explained the reciprocal action of soul and body by the theory of pre-established harmony (*q.v.*). Soul and body for him were like two clocks, originally set together and moving at the same rate.

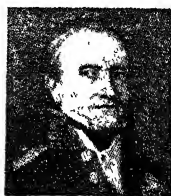
Spinoza and some later thinkers regard the soul not as an independent entity, but as a modification of the infinite, all-embracing cause of the world. On the other hand, the empiricists (Hume, Mill) deny that there is anything real corresponding to the soul, nothing but the immediately given manifold of successive states of consciousness. It has been assumed that internal experiences (emotions, impulses) are to be referred to a real subject which lies at the bottom of them, as external phenomena are referred to matter, and that the unity of consciousness amidst its manifold content points to a simple substratum as the bearer of this conscious process.

These views, however, are now generally rejected. Soul is thought of not as a thing determined by any qualities, but as the constant inner activity of which we are directly conscious, and which, ever receiving fresh stimuli from external impressions, assists in determining the course of individual internal life. See *Metaphysics*; *Metempsychosis*.

Soulbury, HERWALD RAMSBOTHAM, 1ST BARON (b. 1887). British politician. Born March 6, 1887, and educated at Uppingham and University College, Oxford, he was called to the bar in 1911. As Conservative M.P. for Lancaster, 1929-41, he was minister of pensions, 1936-39; first commissioner of works, 1939-40; then president of the board of education, and from 1941 chairman of the assistance board. As Lord Soulbury he became known for his chairmanship of the committee which fixed a new salary scale for teachers (see *Burnham Scale*). In 1944 he presided over the Ceylon commission, and in 1949 became gov.-gen. of that dominion.

Soult, NICOLAS JEAN DE DIEU, DUKE OF DALMATIA (1769-1851). French soldier. Born at St. Amans-la-Bastide, Tarn, March 29, 1769, he joined the army in the ranks in 1785, and by 1794 had become a brigadier. Service under Masséna in Switzerland and Italy added to his reputation, and in 1804 he

was made a marshal. He took part in the fighting against the



Marshal Soult,
French soldier

Austrians and the Prussians, was present at Austerlitz, Eylau, and other battles, and received his dukedom in 1808. Transferred to Spain, he forced the British to

evacuate Portugal in spite of his defeat by Moore at Corunna. Overrunning the S. of the country, he settled at Oporto, from which he was ousted by Wellington.

Appointed to the chief command in Spain in 1809, Soult fought with varying success, winning a great victory at Ocaña, and occupying Andalusia in 1810, but suffering defeat himself at Albuera, while his lieutenant, Marmont, was worsted at Salamanca. Some disagreement with Joseph Bonaparte then caused Soult to leave Spain, but after fighting in Germany during 1813, he was sent back by Napoleon on receipt of the news of the disastrous battle of Vittoria. In spite of Soult's brilliant generalship and determination, his raw levies were no match for Wellington's veterans, and the defeat of Toulouse laid the way to Paris open to the British.

On the abdication of Napoleon, Soult, whose course was dictated at least as much by ambition as by loyalty, made his peace with the new régime; but he declared again for Napoleon in the Hundred Days' campaign, and went into exile after Waterloo. In 1819 he was permitted to return to Paris. Made a marshal again, and from 1827 a peer, he represented France at the coronation of Victoria, and under Louis Philippe was minister for war, 1830-34 and 1840-44. He formed a short-lived ministry in 1832. He died Nov. 26, 1851. His *Mémoires* were published in 1854.

Sound. Term applied both to the cause and to the sensation of hearing. Sound is caused by vibrations, transmitted by waves through the air, detected by the eardrum of human being or animal, and conveyed as a sensation by the aural nerve to the hearing centres of the brain.

Sounds occur in nature in very great variety and degree of complexity. Experimental examination shows that those which have the simplest character are musical sounds. A simple and regular to-and-fro motion of the air gives the

impression of a single or pure musical note or tone. A tuning fork gives such a note. The process can conveniently be represented as a series of sine waves (*see* Wave), in which the crests stand for the compressions and the troughs for the rarefactions. One complete wave, consisting of a crest plus a trough, constitutes a cycle. The arrival of a crest forces the eardrum inwards; a trough pulls it outwards; the movements of the eardrum correspond exactly with those of *e.g.* the tuning fork. The frequency of the waves is called the number of cycles per second. The frequency of the vibration determines what is called the pitch of the note, *i.e.* its position in the musical scale. A frequency of 256 c.p.s., no matter how produced, always gives rise to the sound called Middle C. Double the frequency, and the sound rises an octave in pitch; halve the frequency, and it falls an octave.

It is necessary to distinguish carefully between the intensity or loudness of a note and its pitch. The same musical note will be heard with different degrees of loudness, according to the range over which the air particles in the ear move to and fro. This range is called the amplitude of the vibration, and if it is large the sound is loud; if small, the sound is feeble; but this will have no effect on the pitch, if the time occupied by each vibration remains unaltered.

The Musical Interval

Two musical notes of different pitch have what is called a musical interval between them. This is defined as the ratio of the frequencies of the notes. If, for example, the frequency of one note is 500 per sec. and that of the other 300 per sec., the musical interval is $\frac{500}{300}$, *i.e.* $\frac{5}{3}$. But the interval would be the same for any other pair of notes, such as 250 and 150 or 5,000 and 3,000, which have the same ratio of frequencies, and the notes would bear the same musical relation to one another. There exists a recognized sequence of eight musical intervals, called the natural musical scale, which forms the basis for the production of music. The numerical relations are simple, and are as follows:

Natural Musical Scale (Major)

Note: *do re mi fa sol la si do'*
Interval: 1 $\frac{9}{8}$ $\frac{5}{4}$ $\frac{4}{3}$ $\frac{3}{2}$ $\frac{5}{3}$ $\frac{2}{1}$ 2.

The significance of this table is that, taking *do* as the standard note, the ratio of the frequency of any other note to that of *do* is given by the fraction indicated.

The eighth note from *do*, *i.e.* *do'*, has twice the frequency of *do*, and is called its octave.

This musical scale is recognized by the ear as the same sequence, whatever may be the actual frequency of *do*. We merely pass from one key to another by altering the frequency of the standard or key note, and the corresponding frequencies of the other notes may be found by multiplying that of the key note by the appropriate interval. In actual practice the intervals between *do-re*, *re-mi*, *fa-sol*, *sol-la*, and *la-si*, are further subdivided, so that the scale consists of thirteen notes, the successive intervals between which are called semi-tones.

Concord and Discord

When two or more musical notes are sounded simultaneously, their combined effect on the ear is pleasant or otherwise. In the former case the notes are said to be concordant, in the latter case discordant. In musical instruments the production of concordant effects is aimed at.

No musical instrument produces a pure note consisting of the fundamental frequency alone; the second, third, and higher harmonics, called overtones, at twice, thrice, etc., the fundamental frequency are always present. It is the balance of the harmonics and the relative amplitude of fundamental, second, third, and higher harmonics that determines the timbre, or individual tone, of any particular instrument. The fundamental is the same when Middle C (or any other note) is played on piano, organ, clarinet, saxophone, cornet, harp, or cello; the harmonics identify instantly the instrument producing the note.

All musical and other pleasing sounds consist of sine waves, or complex combinations of simple sine waves. And the combinations can be exceedingly complex. When, for instance, a full orchestra is playing the ear hears at any instant a sound representing the whole ensemble. The sound wave giving this is a combination of the fundamentals and the harmonics produced by every instrument in action at the moment.

Non-pleasing sounds are the results of the arrival at the eardrum of sound waves which are not combinations of sine wave forms. Such sounds are classed as "noise" and their wave forms are said to be random. Their character is often very complex, but they may still be regarded as equivalent to a mixture of pure notes, only there

are no longer harmonic relations between the constituents.

In general, any body which vibrates with a frequency lying within certain limits (about 16 to 22,000 per sec.) will constitute a source of sound, from which the effects are conveyed to the human ear. The transverse vibration of a violin string, the periodic puffs of air emanating from the apertures of a siren, the whirr of an aeroplane propeller, the buzzing of a bee's wings are examples. For the propagation of sound it is necessary that the source should be in contact with some material medium, for example, the air, as is usual, or water, or even the earth. If the vibrating body is in a vacuum, no acoustic effects proceed from it.

The vibrating body sets in similar vibratory motion the medium next to it, and each successive portion of the medium is acted upon in turn, receiving from its predecessor some portion of the motion, until, ultimately, the observer's ear is reached. This transference of motion takes time, and the disturbance travels through the medium in the form of a wave or pulse with a speed depending on the properties of the medium, but independent of the sound's intensity and character.

The only factor affecting the velocity of sound is the character of the medium through which it is transmitted and the temp. Loudness and the pitch or frequency have little influence. Velocity is least in gases and greatest in solids; is independent of the pressure but increases as the square root of the absolute temp. At 0° C. sound velocity at sea level in still air is 1,087 ft. per sec.; in fresh water, 4,714 ft. per sec.; in sea water, 4,990 ft. per sec.; in wood, 12,620 ft. per sec.; in steel, 16,400 ft. per sec. Increase in velocity due to temp. amounts to approx. 2 ft. per sec. for each degree C. of rise in temp. Thus, the velocity of sound in air at sea level at a temp. of 20° C. would be $1,087 + (2 \times 20) = 1,127$ ft. per sec. Velocity increases with altitude. *See* Ear; Harmony; Hearing; Sound Reproduction.

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SOUND REPRODUCTION & AMPLIFICATION

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The origins and development of methods of recording sound are here described, together with the systems of amplification and reproduction used in apparatus ranging from the gramophone and the dictating machine to the sound-film and the magnetophon. See also Edison, T. A.; Gramophone; Loudspeaker; Microphone; Phonograph; Radio; Telephone; Thermionic Valve

From quite early times man has made use of means of amplifying sound. The principle of the megaphone was well known to many ancient peoples and use of it was made for transmitting orders to bodies of workmen and to troops on the battlefield, and for other purposes as well. There can be little doubt that the priests in charge of the oracles and the talk-statues of Greece and Egypt produced their effects by means of the speaking tube and the megaphone. Greek and Roman theatres were out of doors and often very large. All the actors wore masks, typifying the hero, the villain, the heroine, etc., and these seem to have contained some form of megaphone to amplify their voices.

Early Recording Experiments

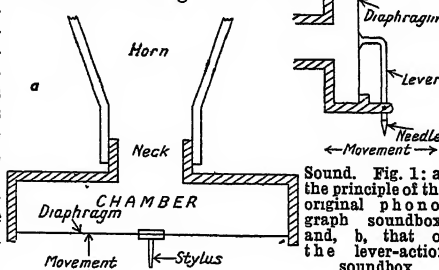
Attempts to find a method of causing sound waves to make their own records date back to about 1800. The first successful instrument was Leon Scott's phonautograph. In this the surface of a metal cylinder, revolving on a screw thread, was blackened with fine soot from a smoky flame. As the cylinder moved sideways along the screw thread, a fixed stylus traced a helical line on the treated surface. The stylus was connected to a membrane stretched over one end of a tube. When sounds such as vowels or single syllables were spoken into the other end of the tube the waves set up caused the membrane to vibrate. The stylus made corresponding movements, which were recorded on the drum as perturbations of the normal regular line of the helix. This instrument and others which followed it, such as Barlow's logograph and Wheatstone's flame recorder, were laboratory apparatus and nothing else. Their inventors had only one end in view: the study of sound wave forms. It does not seem to have occurred to them that if sounds can be made to record themselves, it should also be possible to devise means of sound reproduction from such records.

The first man to grasp this and to realize its possibilities in entertainment was Thomas Alva Edison. In his first phonograph (1877) he used a brass cylinder with a helical groove cut into it. Round the

cylinder, tin foil was wrapped tightly. The stylus of Scott's instrument was replaced by a sharp cutter, attached to a membrane stretched over one end of a tube. When no sound reached the open end of the tube the cutter simply pressed the tin foil evenly into the groove. But the arrival of sound waves caused the membrane carrying the cutter to vibrate; the groove thus became filled with foil cut into "hills and dales" corresponding to the amplitude and frequency of the applied sound waves. The louder the sounds and the more vigorous the vibrations produced, the higher were the "hills" and the deeper the "dales." The number of hills and dales made in a given time depended on the applied frequency.

The sounds were reproduced by reversing the recording process. Instead of a sharp-edged cutter, a round-pointed reproducing stylus, attached to a membrane, was made to run in the groove. Every hill in the record caused the reproducing membrane to be pressed in; each dale allowed it to spring outwards. The record therefore compelled the reproducing stylus and membrane to vibrate just as the recording membrane and cutter had vibrated. In Edison's commercial models, sounds were recorded on and reproduced from wax-coated cylinders—a method still used in office recording machines (see "Dictaphone").

The principle of the soundbox used in early phonographs is illustrated in Fig. 1 a. The



stylus, fixed to the middle of the diaphragm, is moved up and down by the hills and dales encountered by its point as it moves along the groove of a cylindrical record.

These movements are communicated to the diaphragm, which is made to vibrate in accordance with the frequencies and amplitudes recorded. Movements of the diaphragm cause compressions and rarefactions of the air in the sound-box chamber, thus setting up sound waves. The soundbox itself is responsible for some degree of mechanical amplification. The surface area of the diaphragm is much greater than that of a cross section of the neck, hence the amplitude of the compressions and decompressions at the neck is greater than at the inner surface of the diaphragm.

The purely mechanical reproduction obtainable by the simplest possible means from the marks cut into a gramophone record can be judged in the following way: Fold a sheet of stiff notepaper into a sharp V and hold the point of the V lightly in the groove of a revolving record. Reproduction of what is on the record is obtained because the paper is made to vibrate. The reproduction is faint and it is "tinny," but in the early days of sound reproduction few were at all critical of the quality, and the horn and soundbox ensured that a considerable volume of sound was produced.

Though Bell invented the telephone, though Edison discovered (without realizing its importance) the principle of the wireless valve, and though the first practical phonographs were a joint Edison-Bell achievement, their instruments were non-electrical. So, too, was the original gramophone, a considerable improvement on the phonograph. In the mechanical gramophone both the recorder and the reproducer had soundboxes with vertical diaphragms (Fig. 1 b). The cutter of the one and the needle holder of the other were connected to the diaphragm through a lever system, the effect of which was to amplify the movement imparted to the diaphragm. The reproducing stylus was replaced by the easily changeable needle: the records, instead of being rather bulky and very fragile wax-coated cylinders, were flat disks. The vertical dia-

phragm meant that the cuts made in the record were no longer of the hill-and-dale type, but were from side to side. But though the gramophone and its disks with side-

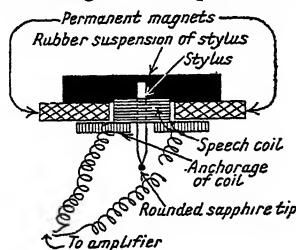
to-side, or lateral, recording ousted the phonograph, there is a good deal to be said in favour of the first hill-and-dale, or vertical, method. The gramophone process was still entirely mechanical, but it proved outstandingly successful; millions of records were made and sold, and the gramophone rapidly became a highly popular supplier of domestic entertainment.

The quality of speech and music recording and reproduction was rapidly improved. The mechanically made record, mechanically reproduced, contained no bass and very little of the higher audible sounds, however; and though listeners who had heard nothing better accepted it as pleasurable, for the human ear is amazingly accommodating, to a listener who has heard reproductions by later methods the distortions of mechanical recording and reproduction are obvious and highly disagreeable.

While recording remained mechanical enormous horns were used in the recording studios. Into their mouths vocalists and instrumentalists sang or played; orchestras had to be tightly packed together close to the wide opening of great funnels. The disk-cutting apparatus was in the studio, which had to be kept at a high temp. in order that the surface of the wax should be sufficiently soft. The process of making copies of the records is explained under Gramophone: Record Manufacture.

The application of the thermionic valve to audio frequency in the wireless receiver showed how it affected amplification in electrical copies of sound waves. In 1925, the first electrically made gramophone records became available. Fig. 2 illustrates the principle of (a) mechanical and (b) elec-

The principle of the electro-magnetic pick-up is shown in Fig. 3. The stylus, whose rounded sapphire tip runs in the groove cut in the record, forms the armature of the permanent magnet and the core of the speech coil, which is wound with many turns of fine wire. The rubber suspension of the stylus is so arranged that it is held rigidly fore and aft, but can move freely from side to side. The grooves in the record impart a side-to-side movement to the stylus. This brings about changes in the magnetic lines of force cutting the turns of the coil, with the result that E.M.F.s are induced in its windings. The amplitudes and



Sound. Fig. 3. Simplified diagram showing the principle of the electro-magnetic pick-up

frequencies of such E.M.F.s are in accordance with those of the sound waves which cause the record to be made. Hence, if both record and pick-up were perfect, voltages which were exact electrical copies of the original sound waves would appear across the coil and could be passed on to an amplifier.

The principle of the recorder is similar to that of the pick-up, though here the train of operations is the exact opposite. Fluctuating currents from the microphone are fed after amplification to the windings of the speech coil, causing

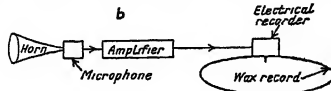
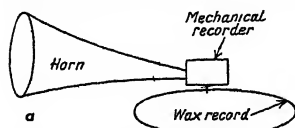
The records and reproducing apparatus used in electrical recording on wax disks and electrical reproduction from them are not unduly expensive; and any number of disks can be mass-produced from the master record. On the other hand, wax disks are easily scratched, broken, or distorted in shape by heat. No perfect reproducing stylus has yet been evolved, for all wear away the impressions cut originally in the grooves; reproduction is for that reason a little less good every time a record is replayed.

Limits of Electrical Recording

Both the recorder and the pick-up have mass and therefore inertia; neither cutter nor stylus can exactly reproduce the original sound wave forms. There is a limit to the frequencies which can be recorded and reproduced faithfully. Though sounds audible to the human ear have frequencies between about 16 and 16,000 C.P.S., the range of a commercial wax record is some 50-5,000 C.P.S. Also, when an orchestra is playing in a concert hall the difference in their power output on *pianissimo* and *fortissimo* passages is enormous; but this cannot be faithfully recorded on the disk. The cutter must be given a certain minimum amount of side-to-side movement if it is to produce a master record from which pressings can be made; the cuts in the disk must give rise to movements of the reproducing stylus large enough to cause E.M.F.s which will operate the associated amplifier. Again, the movements of the cutter are limited, for the number of grooves to the inch and therefore the space that any part of any groove can occupy is fixed by the pitch of the lead screw carrying the recording head. The stylus of the pick-up would be liable to jump out of the grooves were they too wide.

It therefore becomes necessary to use contrast compression in making wax records so that, though the conductor may make his orchestra now fall to *ppp* and now swell to *fff*, the wax record of their performance will show a range not much greater than from *p* to *f*. Various methods of "automatic contrast expansion" are used in some reproducers to counteract this; but results are far from perfect.

Numerous other forms of both recorder and pick-up much less simple than those described have been developed with the object of obtaining both a wider



Sound. Fig. 2: a, mechanical and, b, electrical recording

trical recording. For the second, an orchestra can take up its normal space; the temperature of the recording studio can be comfortable, since the disk cutting apparatus is outside it. A small horn suffices to convey the sound waves to the microphone, which converts them into electrical impulses. The valve amplifier provides the required magnification; the electrical recorder re-converts the electrical impulses into vibrations and makes corresponding cuts in the grooves of the wax disk.

changes in the magnetic field and corresponding movements of the armature. To the armature is attached a sharp-edged cutter; as this is driven over the surface of the wax disk it cuts wavy grooves which record all its side to side movements. The cutter produces wax swarf (fine shavings) which must be got rid of as soon as it is made to prevent it from being swept round on the disk and fouling the edge of the cutter. This is usually done by a suction tube attached to the recording head.

range of frequencies and a less limited range of contrasts; but few have been adaptable for ordinary use with commercial pressed records. Moreover the largest record normally available to the average user is the 12-in. disk, playing for about four mins. Both sides of a dozen 12-in. records can be played at a sitting by instruments with automatic record changers; but there is necessarily a short break whilst the changer does its work.

Surface Noise

The phenomenon called needle scratch, or surface noise, associated with the wax disk system has led to much hard work on the part of inventors and research workers in a continuing vain effort to overcome it. Innumerable materials have been tried for the disks and for needles or stylus tips; and filters of various kinds have been tried in the amplifier stages.

The reason for surface noise is this. The movement of the reproducing tip over the surface of the disk gives rise to random wave forms. It is characteristic of such wave forms that they, so to speak, jar circuits (if they are electromagnetic or electrical wave forms) or materials (if they are air wave forms) into vibration at their natural frequency. An illustration of random sound wave effect may be obtained by raising the lid of a piano keyboard an inch or two and letting it fall: every string is set vibrating and gives out its own note under the influence of the random or noise wave from the slamming of the lid. Atmospherics have similar effects on wireless reception. They have random wave forms and they set the aerial oscillating at the frequency to which it is tuned. In disk reproduction the random wave forms due to needle scratch provoke, from any part of the reproducing apparatus which has a resonance of an audible frequency, responses

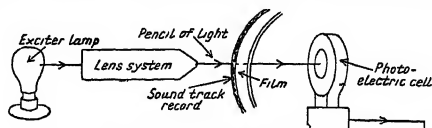
unpleasant to the ear. Limited success in overcoming the phenomenon has been achieved by designing reproducing apparatus which has no resonances within the audible frequency range.

Once the microphone, the loudspeaker, and their associated amplifiers had reached such a state in which the distortion and the noise due to them were almost negligible, the basic problems of sound recording became (1) to find a means of making electrical copies of sound waves impress themselves faithfully on something; and (2) to discover a way of making these impressed copies give rise in the reproducer to fluctuations of voltage or current corresponding exactly with the original fluctuations in the recording microphone circuit. The utter-wax-disk-pick-up system is one way of doing it; there are several other possible methods. The first to achieve successful exploitation was the sound-track system used in talking films. In the early 1920s—and even before—attempts had been made to synchronise wax disk sound records with the action of ciné films. The insuperable difficulty was that whenever the film broke, repairs shortened it by some inches. Hence even if synchronisation were perfect to start with, it grew rapidly worse and worse (sometimes with ridiculous results) when the film was in use.

Sound track recording consists in converting the electrical fluctuations corresponding to sound waves into fluctuations of light and photographing these on the edge of the film. The principle illustrated in Fig. 4 is that of one of the many systems which have been developed. The output of the microphone amplifier is fed to a mirror galvanometer, the frequency and amplitude of the mirror's movement about its axis corresponding exactly to the variations of the microphone currents produced by the sound waves. As the mirror moves, a greater or smaller amount of light is sent through the slit in the second screen and the image recorded on the film is correspondingly varied. Both variable density and variable area systems are in use. In the former, the track

is of constant width, but varies in shade from pale grey to black. In the latter the shade is constant and the width of the track varies.

For reproduction, use is made of the photo-electric cell, in which currents proportionate to the amount of light reaching the cathode are set up by an applied beam of light. The principle of one system is shown in Fig. 5. The sound track record on the film varies the amount of light reaching

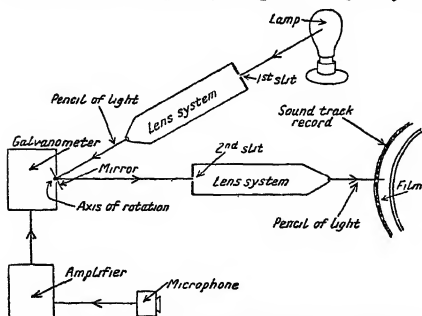


Sound. Fig. 5. Simplified diagram showing method of sound-track reproduction

the photo-electric cell from the fixed source. The currents set up in the photo-cell are therefore copies in both amplitude and frequency of those by which the sound track record was made. They are passed via the amplifier to the loudspeakers in the auditorium.

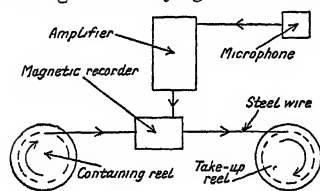
Sound track recording has many merits. A wide range of audio frequencies can be recorded and reproduced: as nothing in the way of a stylus traverses the surface of the record, there is no needle scratch and no wear, save that due to the bendings of the film on its way through the various sprockets of the reproducer and to the slight injuries which it is bound to incur; synchronisation problems do not arise, since sound and action are recorded on the same film; recordings of any length within reason can be made; the volume compression necessary is less than with the wax disk.

The magnetic method of sound recording and reproduction consists in making sound waves record themselves by producing varying degrees of magnetisation in a steel wire, or in minute particles of magnetite fixed to the surface of a flexible ribbon or tape. Suppose (Fig. 6) that the amplified output of the microphone is applied in the form of considerable variations of current to the windings of an electro-magnet; the result will be the production of a magnetic field varying in strength and frequency in accordance with the sound waves exciting the microphone. If a steel



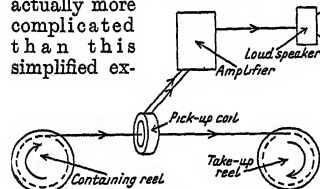
Sound. Fig. 4. Principle of one method of sound-track recording

tape is passed at uniform speed through this varying field, it will



Sound. Fig. 6. The principle of the steel wire recording system

receive, as it travels from a containing reel to a take-up reel, a permanent magnetisation embodying fluctuations corresponding to those of the original sound waves. Now, rewind the wire and pass it (Fig. 7) through a pick-up coil. The varying magnetic fields caused by different parts of the travelling wire give rise in the coil to corresponding E.M.F.s. These are amplified and passed as current fluctuations to the speech coil of the loudspeaker. The processes of both recording and reproduction are actually more complicated than this simplified ex-



Sound. Fig. 7. Illustrating the principle of reproduction from a magnetised wire

planation which, however, gives a working idea of the steel wire magnetic system.

It has many advantages. The cost of the wire is trifling; records are more or less permanent, but can be erased and the wire used again; continuous recordings of considerable length can be made; even long recordings need little storage space. The drawbacks, however, are serious. The wire is bound to contain a considerable noise, due to terrestrial magnetism and other causes; the range of audio frequencies that can be recorded and reproduced is limited.

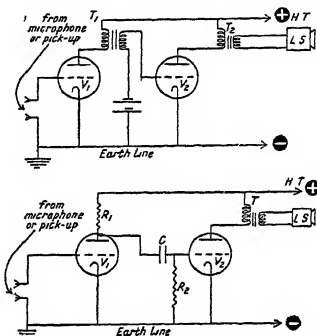
The German magnetophon uses a plastic tape coated with tiny particles of magnetite. Before even a virgin tape passes through the recording head (Fig. 8), it travels through the erasing head, which applies a magnetic field, alternating at supersonic frequency, to each particle. The effect of this field

is to put each particle through its hysteresis curve thousands of times a second and to shake any residual magnetism out of it. The result may be likened to the demagnetisation of a permanent magnet produced by hammering. Whether the tape is used or unused, it leaves the erasing head carrying no record whatever of sound or noise. Whilst passing through the recording head the tape is also subjected to an alternating magnetic field in addition to the fluctuation field which impresses the sound record. The effect of this alternating field may be likened to that of the gentle tapping of a steel bar which so much facilitates its magnetisation when it is being stroked with a permanent magnet. It overcomes the inertia of the particles and renders them much more susceptible to magnetisation by the varying magnetic field of the recording head. In the play-back or reproducing head of the recorder (by which any recording can be monitored), the magnetic fields of the magnetite particles induce currents, which are amplified and passed to the loudspeaker. When the instrument is used purely as a reproducer the erasing and recording heads are, of course, switched out of action.

By the magnetophon principle audio frequencies from some 25 to 12,000 cycles or more a second can be recorded and reproduced with negligible background noise or distortion. The records are permanent (though they can be erased at will and the tape re-used); material costs are not unduly high and storage presents no difficulty. Some form of magnetic tape recording and reproduction may well replace the wax disk for domestic, as well as for other, purposes.

Special precautions have to be taken to minimise distortion caused during amplification by thermionic valves and loudspeakers. The principal types of distortion in amplification are: (1) amplitude distortion, which alters the relative loudness of sounds: harmonic distortion, which means the over-emphasis of certain harmonics of the original sounds, is one form of this; (2) frequency distortion,

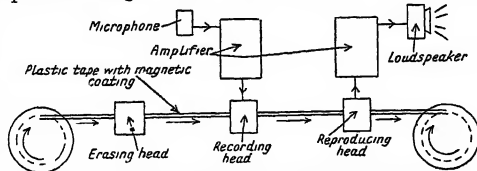
which means the upsetting or suppression of the original frequencies; and (3) phase distortion, which means an alteration of the phase relationship of the original sound waves. Of these (1) and (2) are of the greatest importance in sound reproduction. Small, cheap wireless receivers and disk reproducers are great offenders in the matter of frequency distortion, since few of them can deal at all adequately with frequencies below about 75 C.P.S. or above 4,000 C.P.S.



Sound. Fig. 9. Two possible forms of interval coupling in an A.F. amplifier

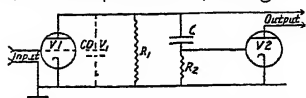
Fig. 9 shows two possible interval couplings of an A.F. amplifier. At *a* transformer coupling is used; the coupling at *b* is of the resistance-capacitance type. The first is seldom used, partly because A.F. transformers are expensive, bulky, and heavy components, but chiefly because they are bound to introduce an undesirable amount of frequency distortion. Both the primary and the secondary windings of a transformer are inductors, components possessing the quality of inductance. The A.C. equivalent of D.C. resistance in an inductor is reactance, which is not fixed, but varies according to the applied frequency. The higher this frequency, the greater is the reactance of a given inductor and *vice versa*. The voltage developed across the primary of an A.F. transformer and passed on via the secondary to the next valve depends upon the reactance: the higher the reactance, the greater is the voltage drop across the primary. The voltage changes across the primary are considerably greater for the upper audio frequencies than for the lower.

For these reasons, the resistance-capacity coupling of Fig. 9 *b* is more usual for A.F. interval couplings. The resistors R_1 and R_2 do not discriminate be-



Sound. Fig. 8. The principle of tape recorders and reproducers of the magnetophon type

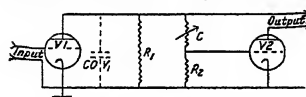
tween high and low frequencies: whatever the frequency the voltage developed across them would seem to be unaffected. But the circuit contains certain capacitances. One of these is visible in the capacitor C in Fig. 9 *b*; other capacitances, though present, are invisible. Amongst these is the output capacitance (anode-cathode) of V_1 . Like an inductor, a capacitor presents reactance; but in this case the higher the frequency, the less the reactance and *vice versa* for a given capacitance. The apparently simple circuit of Fig. 9 is, of course, in practice a very complex one. The "real" circuit is shown in the simplified equivalent form of Fig. 10. The +H.T. line, though at



Sound. Fig. 10. Simplified equivalent of the Fig. 9 circuit. R_1 , R_2 , and C as in Fig. 9. COV_1 = output capacity of V_1 .

high potential with respect to the earth line from the D.C. point of view, is at earth potential so far as A.F.s are concerned.

The invisible output capacitance of V_1 , which is in parallel with R_1 , acts almost as a short circuit path for the higher frequencies. The potentials delivered to the grid of V_2 are those developed across R_2 . The reactance of C and the resistance of R_2 are in series, and since the reactance of C varies according to the frequency, it may be represented, as in Fig. 11, by a variable resistor. This and R_2



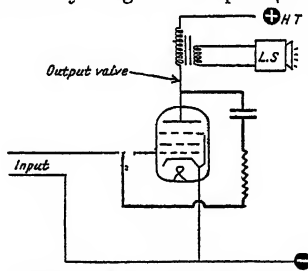
Sound. Fig. 11. Fig. 10 may be redrawn as above to indicate the effect of the varying reactance of C

form a potential divider; the greater the potential drop across C , the smaller that across R and therefore the smaller the potential changes delivered to the grid of V_2 . The reactance of C and the potential drop across it are large for low A.F.s and small for high A.F.s. Hence the combination of COV_1 and R_1 is liable to introduce frequency distortion by poor response to the upper A.F.s, whilst that of C and R_2 has a similar effect on the lower A.F.s. Minimisation of such distortion is by no means simple.

Triodes used in either of the Fig. 9 circuits cause second har-

monic distortion, which is a form of amplitude distortion and means that undue prominence is given to the second harmonics of sounds. This is due to the fact that the so-called straight portion of triode characteristics is really not straight, but slightly curved; the effect when the valve is working is that one half of each cycle receives more amplification than the other. Second harmonic distortion can be minimised by careful choice of R_1 in Fig. 9 *b* circuit; it can be virtually eliminated by using triodes as "push-pull" amplifiers.

Some of the frequency distortion inherent in the Fig. 9 *b* circuit may be greatly reduced by substituting pentodes for triodes, for with these valves the stray capacitances are very much smaller. But harmonic distortion is likely to be more in evidence. This time it is third harmonic, which is far more unpleasant to the ear than second and cannot be got rid of by using valves in push-pull.

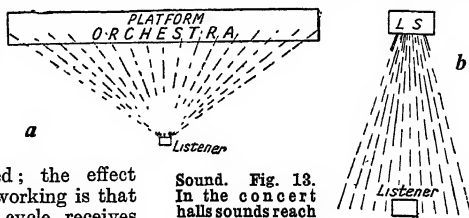


Sound. Fig. 12. The heavy lines indicate a method of applying negative feedback to the output pentode valve of an amplifier

The most effective remedy is the use of negative feedback (Fig. 12) which may be described as the reverse of reaction. In a reaction or positive feedback circuit E.M.F.s from the anode are fed back in phase with those of the grid circuit; exactly the opposite is the case with negative feedback. The effect is to minimise harmonic distortion, though the gain of the amplifier is greatly reduced.

The type of loudspeaker in general use is the moving-coil instrument, in which the inward and outward movements of a light cone set up sound waves in the surrounding air. No loudspeaker is without its resonances, which means that it emphasises some frequencies more than others. The cone must have mass and therefore inertia, with the result

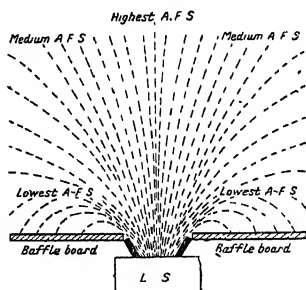
that there is a falling off in the response at high A.F.s. Sound waves from a cone with a to-



Sound. Fig. 13. In the concert halls sounds reach the ear of the listener (both directly and by reflection from walls and ceilings) from many directions (a). Sounds from the loudspeaker are projected (b) as a beam from a single point

and-fro piston action form a kind of beam (Fig. 13); those listening intently to radio or gramophone reproduction tend to look fixedly at the source of this beam, the loudspeaker. The fact that the source of sound is, so to speak, a point rather than an area tends to make reproduction somewhat unrealistic, particularly when an orchestra is playing. Unsuccessful attempts have been made to remedy this defect and to produce "stereophonic" reproduction.

The beam of sound waves from the cone is of a peculiar kind. The waves due to the highest reproduced A.F.s travel outwards (Fig. 14) in a direction almost in a line with the movement of the cone; the lower the frequency the more are the waves dispersed. Waves corresponding to the lower A.F.s would travel round to the back of the cone, with the result



Sound. Fig. 14. Diagrammatic representation of the selective nature of the beam of sound waves from the cone of the loudspeaker. Those of the highest A.F.s reproduced travel almost straight outwards. The lower the frequency, the greater is the tendency of the wave paths to bend round towards the back of the cone. Were it not for the stop imposed by the baffle board, no bass would be reproduced, since "crests" from the front of the cone, corresponding to the lowest A.F.s, would travel round in time to cancel out the "troughs" on the back of it

that the "pushes" in front would cancel out the "pulls" behind, were it not for the interposition of a baffle board. If a radio receiver is removed from its cabinet, it reproduces hardly any bass at all and reproduction is on this account thin and tinny. The larger (within reason) the baffle board, the better the reproduction of the lower A.F.s. For that reason the console type of receiver, with its larger baffle, gives better quality reproduction than the small table model.

Sound. THE. Strait between Denmark and Sweden. It lies between the island of Zealand and Scania and is 30 m. in length, with a breadth of 3 m. at its narrowest, between Elsinore and Helsingborg, and 37 m. at its widest. It leads from the Baltic Sea N.W. to the Kattegat and has a depth of 20 to 120 ft.

Soundboard. Part of a musical instrument that is intended to reinforce the tone of the strings, which would otherwise be too weak to be effective. In string instruments it is called the belly, and is pierced by sound holes. In the pianoforte it is a plate of wood at the back or the bottom of the instrument, according as it is an upright or a grand. The vibrations of the wood, which are molecular, not transverse, respond to the impulse given by the strings.

The soundboard of an organ has a different object. It is the upper table of the wind chest, and is pierced with holes into which the feet of the pipes are set—as many holes as there are departments in the organ. See Organ.

Sounding. Term which refers to the determination of the depth of the ocean or a river bed. The time-honoured method was to drop overboard a lead weight attached to a line, but this is a slow process and impossible with a fast vessel. An echo-sounding method has been developed, which depends on determining the time interval, t , between sending out a sound at the water surface and receiving the signal reflected back from the ocean bed. The depth, d , is then given by $d = \frac{1}{2} vt$, where v is the velocity of sound in water. Most modern equipment records a profile of the sea bed, from which the depth can be read off directly. See Echo Sounding.

Soup. Liquid food, prepared by boiling meat or vegetables in stock. There are three classes of soup, clear soup or consommé, thick soup, and purée. The foundation of all is known as stock,

the best of which is made from fresh meat and vegetables, with various seasonings, but bones and cooked meat are also used. Fish stock is made by boiling the trimmings of fish.

Clear soup is formed by reboiling the stock with a piece of good meat, the white and shell of an egg, and a lump of sugar, and straining it before serving. A broth is unclarified clear soup, the meat being often served with it. Thick soups have starchy material, such as peas, rice, and carrots, mixed in them, or cream and white of egg. All the ingredients of a purée are passed, when well boiled, through a sieve, and served in the soup. Soup is valuable as an appetiser, although some kinds are also highly nutritious. See Broth; Julienne, etc.

Souris. Two rivers of Canada.

(1) An affluent of the Assiniboine, which it joins at Milford, after flowing for its middle course in the U.S.A.; it gives access to the Missouri valley from Canada. It rises in the Dirt Hills of S. Saskatchewan. (2) Small stream in Prince Edward Island, which flows into Colville Bay on the E. coast; near its mouth is the small town of Souris, which has a lobster packing industry.

Sousa, JOHN PHILIP (1856–1932). American bandmaster and composer. Born at Washington, D.C., Nov. 6, 1856, he conducted for theatrical tours before becom-



John P. Sousa, American composer

ing leader of the U.S. marine corps band, 1880–92. He was world-famous as conductor of his own band, which toured in Europe several times, 1900–05, and round the world, 1910–11. Though Sousa composed many comic operas, he is best known by his stirring military marches, e.g. Washington Post, Semper Fidelis, and Hands Across the Sea. He died March 6, 1932.

South. One of the cardinal points. If an observer in the N. hemisphere turns towards the sun, when the latter attains its maximum altitude for the day, he is facing S. The magnetic declination of a place must be known before true south can be determined with a compass.

South, ROBERT (1634–1716). English divine. Born in Hackney, he was educated at Westminster school and Christ Church, Oxford. In 1658 he was ordained, and he became public orator to the university in 1660. In 1670 he was made canon of Christ Church, holding also the living of Islip. He died July 8, 1716. South won fame as a controversialist, but still more by his sermons, which were long regarded as models.

THE UNION OF SOUTH AFRICA

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This article describes the physical features, communications, people, etc., of South Africa, and the history and form of government of the country since the Union was established in 1910. For earlier history of the area see under Cape Province; Natal; Orange Free State; Transvaal. See also under South-West Africa, and in N.V.

The Union of South Africa occupies the southern extremity of Africa, lying between lat. 22° S. and 35° S. and long. 16° E. and 33° E., almost wholly in the south temperate zone.



South Africa arms

full sovereignty in both internal and external affairs.

The interior of the country is a high plateau, about 40 p.c. of the whole surface lying above 4,000 ft. This plateau is bounded on the E. and S. by the escarpment of the Drakensberg, the principal mt. range of the country, and the

ranges which continue it to the S. and W. Parallel to the latter and to the S. coast run the Zwartberg and Langeberg ranges, which divide plateaux at lower levels, the coastal plain lying in turn below the Langeberg. Farther E. the descent from the Drakensberg to the coast is more regular. The rivers running E. from the Drakensberg watershed are short, the country they traverse is well watered. The Union's longest river, the Orange, and its tributaries run W. to the Atlantic through drier country.

CLIMATE. The mean summer temps. over most of the country range from 60° to 80°, and the mean winter temps. from 40° to 60° F.; temps. are no higher in most of the N. areas than on the S. coast, as the greater altitude compensates for the lower latitude.

On the high plateaux there is a great variation in daily temp., the nights being cool at all seasons. The rainfall exceeds 25 ins. over about one-quarter of the country; this quarter comprises the E. Transvaal, N.E. Orange Free State, Natal, the extreme E. and the S. coast of the Cape Province. There the fall varies from 25 ins. to 50 ins., and in places exceeds 70 ins. Westward the country

the more densely wooded country called bushveld. In the Natal coastal belt there is a narrow fringe of dense sub-tropical bush. The central and N.W. parts of the Cape Province are dry, the vegetation ranging from the sparse stunted bushes of the Karroo to the true desert of the Namaqualand coast. The Cape region, comprising the coastal belt and the adjoining mts. from St. Helena

does not own. The administration's road motor service covers 18,000 m. S. African airways link the principal centres of the Union, and (in cooperation with B.O.A.C.) the Union with central and N. Africa and with the U.K. Private companies operate local air services.

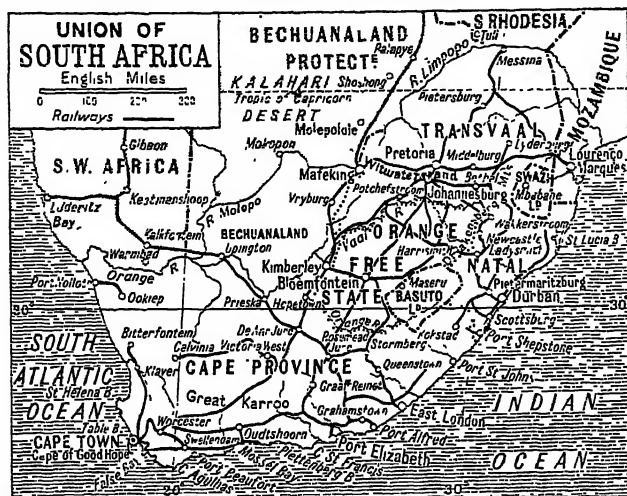
Roads are maintained by the provincial administrations and local authorities, but the National Roads Act, 1935, provided for a system of more than 5,000 m. of national roads, planned by a central board and supported by central funds. The Union has no navigable rivers.

CITIES AND TOWNS. There are nine principal urban centres in the Union. The Witwatersrand is an agglomeration of towns which represent the greatest concentration of pop. in the country. They are Johannesburg (pop., 1946, 727,943), Germiston (128,971), Springs (106,016), Brakpan (83,242), Benoni (74,123), Roodepoort (72,034), Krugersdorp (71,631), Boksburg (53,419), Randfontein (32,323), and Nigel (30,275). The other principal cities are the legislative capital Cape Town (454,052), the administrative capital Pretoria (236,367), Durban (357,304), Port Elizabeth (146,231), Bloemfontein (82,322), East London (78,530), Pietermaritzburg (63,162), and Kimberley (55,645).

RESOURCES AND INDUSTRY. The Union is very rich in gold, coal, and diamonds, and has notable deposits of copper, asbestos, tin, silver, platinum, manganese, chrome, iron. Most of this mineral wealth is in the Transvaal. Ores from which uranium can be extracted are obtained from the Witwatersrand gold mines and the Gordonia dist. of Cape Province; the production of uranium is controlled by the govt.

The principal farm crops are maize (chief area, N. Orange Free State and S. Transvaal), grapes, wine, and deciduous fruit (S.W. Cape Province), citrus fruit (Transvaal bushveld, Natal, E. Cape Province), sugar cane (Natal coast), wheat and other winter cereals (S.W. Cape Province), tobacco (parts of the Transvaal and S. and S.W. Cape Province), and vegetables. Pastoral products, which contribute slightly more in total value than arable, are meat, wool, dairy products, mohair, and skins. S. Africa ranks fifth in world wool production.

Manufacturing industry was greatly encouraged by the two



South Africa. Map of the four provinces forming the Union

becomes drier, the rainfall being less than 5 ins. in parts of the Karroo and Namaqualand. A belt down the W. coast, about 150 m. wide, constitutes the winter rainfall area, where more than two-thirds of the rain falls in the winter months; but only in the S. part of this belt is the rainfall significant. Over most of the rest of the country more than two-thirds falls in summer. Snow falls every winter on the higher mts., rarely elsewhere. Violent hailstorms are a feature of the summer.

VEGETATION AND FAUNA. The characteristic vegetation in the S. Transvaal, most of the Orange Free State, and a belt E. of the Drakensberg extending from N. Natal to the neighbourhood of Port Elizabeth, is tall grass, green in summer and brown, dry and dusty in winter. Below the Drakensberg patches of bush and trees are interspersed with open grass country, and savanna is found also on the N. and W. fringes of this area; for the rest the grassveld is treeless.

The N.W., N., and E. Transvaal pass from open grass country through park-like savanna to

Bay to Port Elizabeth, is a country of short, dark-green, leathery-leaved bushes and shrubs, and very rich in wild flowers. Forest, as distinct from bush, is rare in S. Africa; the most notable forests are in the Knysna district, the Amatola mts., and at Woodbush in N. Transvaal.

S. Africa has been noted for the abundance and variety of its wild fauna. Some of this is still widely distributed, but most of the game is now concentrated in the reserves where it is protected, notably the Kruger national park in the E. Transvaal. Lion, elephant, buffalo, giraffe, many varieties of antelope, and smaller game exist there in natural conditions.

COMMUNICATIONS. The rlys., harbours, and chief airways are state-owned and operated by the S. African rlys. and harbours administration. The rly. route mileage owned and operated within the Union is 11,788; to this should be added the rlys. of S.W. Africa, which were amalgamated with the Union system in 1922, and the main line through Bechuanaland to Bulawayo, which the S.A.R. and H. operates but

Great Wars. By 1941 this activity was contributing 18 p.c. of the national income, second only to mining. Food, drink, and tobacco constitute the largest industrial group, with metal and engineering second. Other important manufactures are clothing and textiles, leather, chemicals, explosives, furniture, building materials, printing, motor vehicle assembly, and wagon building.

The Union's principal imports are clothing and textiles, motor vehicles, locomotives, machinery, hardware, petroleum products, foodstuffs, chemicals, leather and rubber goods, timber, paper. The chief exports are gold, wool, diamonds, fruit and jam, sugar, hides and skins, coal, wattle bark and extract, asbestos. The chief sources of imports are the U.K. and the U.S.A., which are also the principal markets for S. African exports. In 1945 the U.K. provided 32.2 p.c. imports and received 26.5 p.c. of the exports.

POPULATION. The people of S. Africa comprise four chief groups, European, African (commonly called native), Coloured, and Asiatic. The African group consists of the dark-skinned, indigenous peoples speaking Bantu languages. The Coloured are people of mixed blood including European, Bantu and Negro, Hottentot and Malay elements in various proportions. But for census purposes the pure Hottentot and Bushmen races, which survive in small numbers, are included under this heading. The Asiatics are almost all Indians, though there is a small number of Chinese. The Europeans are the descendants of various groups of European colonists. Those who came in the 17th and 18th cents. were predominantly Dutch, but included large German and French elements that were assimilated by the Dutch. Settlers from the British Isles came in the 19th and 20th cents., and there have been smaller numbers from other European countries. The earlier, mainly Dutch group, has evolved a distinct nationality (*Afrikaner*) and language (*Afrikaans*). Owing to intermarriage and the absorption of individuals of one European group by the other, it is impossible now to classify the European population in terms of origin or descent. The only classification is by language. About 56 p.c. of the Europeans are Afrikaans-speaking, 40 p.c. English-speaking, and 1.6 p.c. use both languages equally.

The proportions of one group to another (*see table*) remain fairly constant. Although the

with the house of assembly, or within 120 days of the dissolution of the house if this has led to a

SOUTH AFRICA ; DISTRIBUTION OF POPULATION, 1946

PROVINCE	EUROPEANS	AFRICANS	COLOURED	ASIATICS	TOTAL
Cape ..	859,611	2,327,099	813,190	16,901	4,016,801
Natal ..	232,923	1,699,068	22,623	228,119	2,182,733
Transvaal	1,041,835	3,049,169	55,270	37,503	4,183,779
Orange Free State ..	201,091	660,473	13,967	14	875,545
UNION ..	2,335,460	7,735,809	905,050	282,539	11,258,858

percentage of Europeans in the total pop., which was 21.6 in 1904, had fallen to 20.7 in 1946, the difference is at least partly explained by the incomplete enumeration of non-Europeans in the earlier census.

Of the European pop. in 1936, about 88 p.c. were Protestant, 4.6 p.c. R.C., and 4.5 p.c. Jewish. Of the Coloured people 4.6 p.c. were Mahomedan, 4.7 p.c. R.C., and the rest Protestant. Of the Asiatics 73 p.c. were Hindu, 19 p.c. Mahomedan, and most of the remainder Christian. For the Africans the figures were: heathen, 50 p.c.; European Protestant Churches, 29 p.c.; Native Separatist Churches, 16 p.c.; R.C., 3 p.c.

ADMINISTRATION. The Union consists of four provinces (Cape Province, Natal, Orange Free State, and Transvaal) which united in 1910. At the head of the govt. is a governor-general, representing the king and appointed by him on the advice of his S. African ministers. The prime minister and 11 other ministers forming the cabinet must be members of one of the houses of parliament, to which the cabinet is responsible.

The lower house of parliament, the house of assembly, consists of 159 members, of whom three represent the natives, and six S.W. Africa. The rest are elected by the European pop. (on universal adult suffrage, male and female) and a restricted Coloured electorate in the Cape Province, in single-member constituencies, which are re-delimited every five years by a commission of judges. The upper house, or senate, consists of 48 members. Of these each prov. elects eight, the electoral body consisting of the provincial councillors and the members of the house of assembly for the prov., voting by proportional representation; S.W. Africa sends four (two nominated, two elected). The gov.-gen. appoints another eight, and four are elected by the natives. The senate is elected for 10 years, but may be dissolved simultaneously

change of govt. Disagreements between the two houses are resolved by a simple majority at a joint sitting.

Each prov. has a provincial council, elected by the same voters and representing the same constituencies as the house of assembly, except that the number of constituencies must be at least 25; this is the number in Natal and the Orange Free State, which have fewer members in the house of assembly. The administrator, appointed by the central govt. for five years, is the head of the executive, and is assisted by an executive committee of four elected by the council. Provincial ordinances must be approved by the governor-general-in-council, and must not be in conflict with a Union statute. They deal principally with education (other than university education), hospitals, roads, and local govt.

Legal Jurisdiction

The supreme court consists of an appellate division, sitting in Bloemfontein, and seven provincial or local divisions. Judges hold their commissions, as in the U.K., during good behaviour; the common law of the Union is the Roman-Dutch. The lower courts are those of the magistrates, who are civil servants; the country is divided into magisterial districts for this and various administrative purposes.

Defence is entrusted to the Union defence force, of which the S. African air force and naval forces are branches. There is compulsory part-time training, in principle, for all white male citizens from the age of 17. The civil service is a professional and non-political body, in which appointments, promotions, and discipline are controlled by an independent public service commission of three members.

In many respects the Africans are subject to a separate administrative organization under the dept. of native affairs. Special courts administer native law.

Certain areas are reserves in which no non-African may hold land, and in some of these the tribal chiefs retain certain powers. Many of the laws of the Union discriminate between different groups of the pop., and some persons are therefore subject to controls from which others are free (e.g. pass laws apply to Africans, and prohibition of inter-provincial migration applies to Asiatics).

EDUCATION. Primary and secondary education, which are controlled by the provs., are free for Europeans, and compulsory up to the age of 16 or to standard VI or VIII, according to the prov. There are, however, many private schools at which fees are paid. For the non-Europeans education is neither compulsory nor free, except for Coloured children in the Cape Province. It is provided chiefly by missionary and other private bodies, with state assistance. A start has been made with state schools for non-Europeans.

Universities and Newspapers

Universities are under the supervision of the Union dept. of education. There are five teaching universities—Cape Town, Stellenbosch, the Witwatersrand, Pretoria, and Natal, of which the second and fourth use Afrikaans as the teaching medium, and the others English. The federal university of South Africa, of which the last three in the above list were formerly colleges, still includes four university colleges—Rhodes (Grahamstown), Orange Free State (Bloemfontein), Potchefstroom, and Huguenot (Wellington).

PRESS. Of the English daily journals four (Cape Argus, Cape Town; Star, Johannesburg; Daily News, Durban; Diamond Fields Advertiser, Kimberley) constitute the only considerable newspaper chain in the Union. Other important daily papers are the Cape Times (Cape Town), Natal Mercury (Durban), Rand Daily Mail (Johannesburg). All the English dailies are politically independent but support the United party. The Afrikaans journals are more closely controlled by political parties. The chief are National Party: Burger (Cape Town), Transvaler (Johannesburg), Volksblad (Bloemfontein); Afrikaner Party: Vaderland (Johannesburg); United Party: Suiderstem (Cape Town), Volkstem (Pretoria). There is also a considerable number of Sunday papers, weekly journals of opinion, and popular magazines.

HISTORY. From 1910, when the Union of S. Africa came into

being, to 1948 three men, former leaders of the Boers in the war of 1899–1902 (Generals Botha, Smuts, and Hertzog), held the premiership of the Union. During that time the only attempt to break away from the British Empire came soon after the outbreak of the First Great War, when a small group of Boers, including De Wet, Beyers, and Delarey, planned to overthrow the existing govt. Delarey was killed Sept. 15 by a shot from a police patrol while he was travelling in a car from Johannesburg. De Wet seized Heilbron; Beyers raised a small force in the Transvaal. Botha took the field at once and put Beyers and his force to fight near Pretoria. By the end of Nov. it had virtually ceased to exist. De Wet, his force having also been scattered by Botha, surrendered on Dec. 1, and the rising was at an end.

The Botha govt. of 1910 and its successors under Smuts in 1919–24 were supported by the S. African party, which aimed primarily at drawing the two white groups together and drew support from both. The Unionist party, which was purely British, was absorbed by the S.A.P. in 1921. Many Afrikaners felt that their national aspirations were not satisfied by the S.A.P., and under the leadership of Hertzog seceded from it in 1912, forming the National party. In addition there was a small Labour party with its main strength on the Rand. The participation of the Union in the First Great War on Great Britain's side gave great impetus to the former, and the suppression of the 1922 Rand strike impetus to the latter. They made an electoral pact, were successful at the 1924 elections, and formed a coalition govt. under Hertzog.

This government was shaken by the world economic crisis in 1932, and in the following year Smuts, with a view to obliterating old political distinctions, entered a new coalition under Hertzog. This led to a fusion of the two main parties in the United party. Hertzog's successive govts. aimed at the recognition of S. Africa's sovereign independence (obtained by the Statute of Westminster, 1931) and the establishment of relations between the groups of the pop. on a basis that secured domination to the Europeans. This policy was embodied in a series of Acts in 1936, providing for the separate political representation of the Africans (as outlined

above) and for the segregation of non-European groups in respect of land-ownership.

In each of the old parties there was a wing which refused to accept the fusion of 1933–34. These became the "purified" National party (under Dr. D. F. Malan) and the Dominion party (under Col. Stallard). On the outbreak of war in Sept., 1939, Hertzog proposed neutrality, Smuts rejected it, and the cabinet split. A majority in parliament supported Smuts, who formed a new govt., and whose supporters retained the name of the United party. Hertzog's followers seceded, and most went over to the now "Reunited" National party of Malan. Hertzog himself and a few whose advocacy of equal rights for the English-speaking section was opposed by the Nationalists formed the Afrikaner party.

The Second Great War

Under the Smuts govt. the Union played its part in the Second Great War, sending divs. to E. and N. Africa and to Italy. A total of 345,049 men and women, all volunteers, served in the S.A. forces, many on home defence only; 6,840 were killed. The S.A. 1st div. fought with distinction at Alamein; and the S.A. 6th armoured div., at times with the 8th army, at times with the 5th, was the spearhead of innumerable Allied advances in Italy. After the war, at elections held in May, 1948, a Nationalist-Afrikaner party coalition was successful in obtaining a small majority, and Dr. Malan became premier. See N.V.

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South Africa, UNIVERSITY OF. Educational body founded in 1918. Its headquarters are at Pretoria.

and it took the place of the university of the Cape of Good Hope. A federal university, it comprises four university colleges: Orange Free State, at Bloemfontein; Huguenot, at Wellington; Rhodes, at Grahamstown; and Potchefstroom. The university had 86 professors and 3,185 students in 1945. Other universities in South Africa are those of Cape Town, Stellenbosch, Witwatersrand, Natal, and Pretoria.

South African Air Force. Body founded in 1920, which is a branch of the S. African permanent force, being administered by the department of defence. At the beginning of the Second Great War the S.A.A.F. consisted of one squadron and a total of 1,500 men; by the end of the war, in which it served mainly in the Western Desert and the Mediterranean, it had a total of 34 active squadrons.

South African War. Struggle between Great Britain and the Boer republics of the Transvaal and the Orange Free State, Oct., 1899, to May, 1902. Great Britain had, by treaty, the right of controlling the external affairs of the Transvaal and, moreover, had an interest in the affairs of the white population that had been attracted thither by the discovery of gold. The Boer government refused to give civic rights to these men, and in 1899 there were protracted negotiations on these and other points in dispute. No agreement had been reached when, on Oct. 8, the Boers issued an ultimatum, demanding the withdrawal of the British troops who had been sent or were on the way to South Africa. This was treated as a declaration of war.

The Boers at once invaded Natal, and there the first engagements took place. The Boer artillery was surprisingly good and their tactics by no means despicable, but the British regulars, about 4,000 in number, were excellent soldiers, and both sides could claim successes. At Talana Hill and Elandslaagte the British were victorious, but they met with a disaster at Nicholson's Nek. Before the end of Oct., Sir George White, the commander, and his small force were closely shut up in Ladysmith, around which was an increasing army of Boers, while others invested British garrisons in Mafeking and Kimberley. In Nov. a British army gathered at Cape Town and was ready to move forward. Sir Redvers Buller led the largest contingent to the relief

of Ladysmith; Lord Methuen with the Guards and Highlanders set out for Kimberley, while between the two was Gen. Gatacre. All met with defeat.

Methuen came into action first. After two skirmishes, Belmont and Graspan, he reached the banks of the Modder on Nov. 27. Across it the Boers were in strength, but the British compelled the enemy to vacate their positions among the hills. Proceeding farther, Methuen delivered a night attack on some strong Boer lines at Magersfontein on Dec. 11-12. This was a total failure. On the previous day Gatacre's force had met with a reverse at Stormberg.

The hopes of Britain were by this time centred on Buller. Having reached the Tugela, he attacked at Colenso on Dec. 15. The strength of the Boer positions, and the military skill of their defenders, were underrated, and the result was a loss of 1,000 men and, much more serious, a blow to British prestige. It was a slight set-off when in Jan., 1900, a severe attack on Ladysmith was beaten back. By this time Lords Roberts and Kitchener were on the way to S. Africa. Meanwhile Buller failed again at Spion Kop, Jan. 22.

Roberts sent French with a mounted force to relieve Kimberley, and the town was entered on Feb. 15. This prepared the way for the main move against the Boer forces. Their retreat was cut off and they found refuge in the dry bed of the Modder. Then took place the battle of Paardeberg, Feb. 27, which ended in the surrender of 4,000 Boer fighting men. Buller by this time was able to renew his attacks on the Tugela positions. After heavy fighting, on Feb. 28 his army joined hands with the defenders of Ladysmith.

Bloemfontein and Pretoria

Roberts lost no time in following up his successes. Having crossed the Orange, he received the surrender of Bloemfontein on March 13, while an appeal for peace showed that the Boers grasped the realities of the situation. For six weeks the British remained at Bloemfontein, preparing for a further advance by clearing the enemy from the neighbourhood and making safer the rly. line to Cape Town. In these weeks Christian De Wet showed his skill; his chief successes were perhaps at Sanna's Post and Reddersburg.

On May 3 all was made ready for another forward move. On June 5 Roberts entered Pretoria, freeing 3,000 prisoners. Mafeking

had been relieved on May 17, and Buller had cleared the Boers from Natal, thus opening up a converging line of attack on the Transvaal. From Pretoria Roberts moved E. to Komati Poort. Then Lydenburg and Barberton fell, leaving the Boers almost without a stronghold. In Sept. the Transvaal was formally annexed, and in Dec. Roberts left the completion of the task to Kitchener.

During the African summer the Boer cause revived. De Wet as usual was busy, and generally successful in his raids in the Orange Free State, as was Botha in the Transvaal, while the area of warfare spread again to Cape Colony. Mounted men were sent out from England and a number of flying columns organized. Kitchener's plan was to clear the worst areas of their inhabitants, gathering the women and children into so-called "concentration" camps, and to hunt down the fighting men.

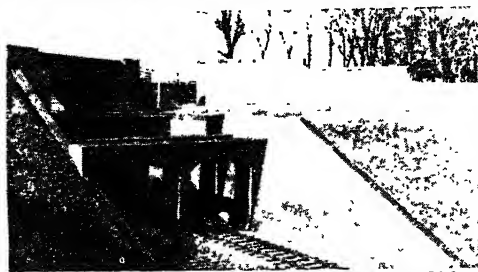
End of the Campaign

Kitchener's organization steadily improved. His rlys. became safer and better, and his mounted men more numerous and expert. He ringed round the foe with a chain of blockhouses and completed arrangements for operating away from the lines of rly. This was proved when overtures for peace, which were rejected, came in July, 1901, from the Boers. Encounters continued through the year, and early in 1902 the Boers captured Methuen at Tweebosch, but in March they asked unconditionally for peace. The treaty of Vereeniging was signed at Pretoria on May 31, 1902.

The British troops had increased until the fighting force must have numbered 250,000. The losses were 5,774 killed and 22,829 wounded, while over 20,000 died of disease. The Boers may have numbered altogether 95,000, and the killed about 4,000. At the end 40,000 Boers were prisoners of war. In Jan., 1902, there were 121,965 Boers in the concentration camps. See Botha; De Wet; Kitchener; Ladysmith; Paardeberg; Spion Kop, etc.

Bibliography. The Great Boer War, Sir A. Conan Doyle, 1902; The Times History of the War in S. Africa, 1900-09; Official History, Sir F. Maunice, 1906-10; German Staff History, Eng. trans. 1905.

Southall. Borough of Middlesex, England. It is about 12 m. W. of London, with a station on the Western region of British Railways, and served also by the Grand Union Canal. Incorporated as a borough in 1936, it returns one



Southall, Middlesex. The bridge built by Brunel which carries a road and canal over the railway

members to parliament. It developed as an industrial centre from 1880, and after the First Great War rapidly increased in area. The chief building is the parish church of Norwood Green, partly Early English. A remarkable bridge by Brunel carries the road over the canal and the latter over the rly. The Brent defines part of the borough boundary. Pop. est. 57,000.

South America. The South American continent, forming the S. part of the land of the W. hemisphere. It is a distinct land mass, surrounded by sea except where the Isthmus of Panama, now pierced by a canal, joins it to N. America. The continent extends through every habitable latitude from 12° N. to 56° S. Its total length from Cape Gallenas in Columbia to Cape Horn in Tierra del Fuego is about 4,500 m. Max. width, from Cape San Roque to Cape Parina, is about 3,200. Total area is approx. 7,000,000 sq. m., with a pop. estimated at 90,000,000. About half the continent is occupied by Brazil. The other countries are Colombia, Venezuela, British and French Guiana, Surinam, Ecuador, Peru, Bolivia, Chile, Paraguay, Uruguay, and Argentina. The pop. of the continent is compounded of European (mainly Iberian), African, and indigenous Indian elements. People of pure European ancestry are not in the majority, yet European influence and character are predominant, and a civilization of a decidedly Latin type, modified by local influences, has evolved. In the remote interior, much of which remains unexplored, there still lurk many tribes of savages with primitive customs and languages. Their number is unknown.

Physically S. America is broadly divided into the region of mountains (Andes), the region of tropical forests (Amazon river), and the region of open plains (Argentina and Patagonia). The great Brazilian plateau is another not-

able element in its configuration. The Andes form a backbone stretching for 4,500 m. The three great river systems are the Orinoco, the Amazon, and the Paraná. For further details, physical, climatic, and historical, see under the various countries.

See also America; Latin America; Patagonia; and map facing p. 7676.

Southampton. Co. and mun. bor., county of itself, and seaport of Hampshire, England. It is 79 m. S.W. of London by rly., having several stations, and stands on a peninsula between the mouths of the Itchen and the Test at the head of Southampton Water. It was made a co. bor. in 1888, has elected two M.P.s since 1295, and has a suffragan bishopric in the diocese of Winchester. Pop. est. 170,360.

Southampton was destined to be a great port by reason of a deep, sheltered estuary, the phenomenon of double tides, and above all its position in the centre of the S. coast. The harbour developed from the efforts of a company which in 1836 purchased 216 acres of mudland near the Town Quay. Enlargements to the docks in the 19th century were carried out partly by rly. companies; in 1927-34 there was another big extension, bringing into being the King George V graving dock. The present docks establish Southampton as the leading British passenger port and the regular terminal of the Queen Elizabeth, Queen Mary, and Union-Castle liners, also of R.M.S.P. and C.P.R. liners (see Dock illus., pp. 2,755-57). During the Second Great War Southampton was the main base for U.S. forces. It is also an airline terminal and flying-boat base.

The district which is now Southampton was occupied in the Stone Age. The settlement of Clausentum established by the Romans was a link in their communications with the Continent. The Saxons first landed on the shores of Southampton Water, calling their settlement there Hamwi (it was excavated in 1950). During the visit of King Canute

the well-known story of his rebuking the courtiers originated. Development began after the Norman Conquest, when the town walls and the Bargate (still standing) were constructed. Other relics are the Red Lion inn referred to by Shakespeare in King Henry V, the Ancient Water House, the chapel of S. Julien, and Tudor House.

The modern civic centre provides excellent library, health, cultural, and educational services. The fine Guildhall accommodates over 2,000 people. A grammar school dates from 1554 and a university college from 1862. S. Michael's, the oldest church standing, is of Saxon and early Norman origin. S. Mary's, on which site the mother church of Southampton stood from the 11th century, and Holy Rood, dating from 1320, were damaged by bombs in the war. During 1940-44 the air raid warning was given 1,606 times, 631 people lost their lives, 5,000 properties were destroyed, 10,000 seriously damaged; the worst raids being on the nights of Nov. 30 and Dec. 1, 1940.

Here is one of England's largest oil storage centres; Schneider Trophy seaplanes and Spitfires were evolved; there are engineering works, iron and brass foundries, flour mills, and factories making chemicals, paints, plastics, gloves, and tobacco. There are commons, parks, a sports centre covering 268 acres, and the world's oldest bowling green (1299). Excursions to the New Forest are easy. See illus. facing p. 7677.

Southampton. Large island of Canada, in Hudson Bay. It lies S.W. of Fox Channel, and has the strait, Roe's Welcome, on the W.

Southampton, EARL OF. English title granted successively to the Fitzwilliam and the Wriothesley families. The first creation was in 1537, in favour of Sir William Fitzwilliam, keeper of the privy seal. On his death in 1542 the title became extinct, but was revived five years later for Thomas Wriothesley. He was the grandfather of Henry, 3rd earl (v.i.). The 4th earl Thomas (1607-67), was a staunch royalist, who held considerable property in London still associated with his name, e.g. Southampton Row. On his death the title became extinct.

Southampton, HENRY WRIOTHESLEY, 3RD EARL OF (1573-1624). English courtier and patron of letters. Born Oct. 6, 1573, he succeeded his father as earl in 1581, and studied at S. John's College,



Southampton arms

Cambridge, 1585-89. From 1590 he became known as a popular figure at court and a generous patron of the poets, notably Shakespeare, who dedicated to him *Venus and Adonis*, 1593, and *Lucrece*, 1594. It is held by some scholars that the Sonnets of Shakespeare are addressed to Southampton. He accompanied Essex to Cadiz and Ireland, and was imprisoned for complicity in Essex's rebellion. Released by James I, he died serving at Bergen-op-Zoom, Nov. 10, 1624.



3rd Earl of Southampton,
English courtier
After Mirevelt

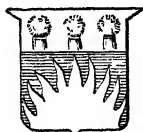
He accompanied Essex to Cadiz and Ireland, and was imprisoned for complicity in Essex's rebellion. Released by James I, he died serving at Bergen-op-Zoom, Nov. 10, 1624.

SOUTHAMPTONSHIRE OR COUNTY OF SOUTHAMPTON. Official name of the English co. usually called Hampshire (*q.v.*).

Southampton Street. London thoroughfare. Opening N. from the Strand to Covent Garden, W.C., and laid out in 1704, it occupies part of the site of Bedford House, the residence of the earls and dukes of Bedford, 1552-1700.

Southampton Water. Opening of the English Channel. It extends from the Solent and Spithead for 10 m. inland. Its breadth is about 2 m. The Isle of Wight forms a natural breakwater, and the inlet is a safe harbour. The Test, Itchen, and Hamble flow into it.

South Australia. State of the commonwealth of Australia. Bordering all the other states except



South Australia
arms

Tasmania, it lies between Victoria and Western Australia along the S. coast. Its coast is ironbound and harbourless in the W., but indented by Spencer and St. Vincent Gulfs in the E. The W. of the state is occupied by the S. portion of the Central Australian plateau; here the Musgrave Ranges lie E.-W., and rise in Mt. Woodroffe to 5,200 ft., the highest point in the state. S. of Lake Gairdner, which occupies a depression in the plateau, are the Gawler Ranges. In the N.E. is the basin of internal drainage of Lake Eyre. Here are intermittent rivers, *e.g.* Barcoo and Frome, which flow only after torrential rains but which are frequently marked by water holes, useful on the stock routes. Only small streams reach the sea, except the lower Murray

Only in the Mt. Lofty ranges of the S. Australian Highlands, and among the volcanic mountains, including Mt. Gambier in the extreme S.E., does the annual rainfall exceed 30 ins., and except between Spencer Gulf and the Murray, it is less than 15 ins. per annum. The hills are forested with eucalyptus and acacia; the S. is sandy and limestone scrub; and the N. is part of the Central Australian Desert. Area of state, 380,070 sq. m.

Primary production is centred upon wheat and sheep growing, with some barley, oats, and hay. Although the main interest in sheep is wool, crossing of English breeds with the merino has produced excellent fat lambs. Fruits of all kinds flourish. Irrigation areas on the banks of the Murray from Renmark to Waikerie, developed for the settlement of ex-servicemen of the First Great War, became the centre of the dried and preserved fruit industry. Vineyards near Adelaide, Barossa, and in the Murray Irrigation area yield 75 p.c. of Australian wine. Uranium has been discovered, and copper is the mineral most profitably worked.

The railways are government-owned, and except for those on Eyre Peninsula which converge at Port Lincoln, the system centres on Adelaide. This is connected by rail to Melbourne and Perth. The projected line to Port Darwin extends to Alice Springs in Central Australia. Branch lines serve the main agricultural areas. For many years the line to Broken Hill, N.S.W., was the only rly. outlet from that important mining area to the sea, and its silver lead is carried to Port Pirie for smelting.

S. Australia sends 10 members to the federal senate and eight to the house of representatives; the state legislative council has 20 and house of assembly 39 members. Education is compulsory and free up to 14. The state prides itself on having been the first in Australia

to introduce town planning and public trustee acts and the extension of parl. franchise to women.

Pieter Nuyts discovered the S. coast, and reached Nuyts Archipelago in 1627. Lieutenant Grant reached Mt. Gambier from Botany Bay in 1800. Flinders in 1801 discovered Spencer Gulf and Kangaroo Island, and met the French exploring ship *Le Géographe* in Encounter Bay. Sturt sailed down the lower Murray in 1830. The first settlement was made by Thomas Whalley, on Kangaroo Island, in 1816. In 1836 the pioneer immi-



South Australia. Map of the progressive, wheat-producing, and fruit-growing state of the Australian Commonwealth

grant ship, closely followed by eight others, arrived, and Hindmarsh, the first governor, proclaimed the foundation of the colony. The pop. in 1838 numbered 3,680, mostly settled in or near Adelaide, the state capital; it is now 646,216. See Adelaide; Australia and map. Consult S. A., a Geographical Study, C. Fenner, 1931.

South Bend. City of Indiana, U.S.A. Situated on the St. Joseph river, in the co. of that name, and 85 m. E.S.E. by rly. from Chicago, it lies on the crest of the watershed separating the St. Lawrence and Mississippi river basins. It was an Indian settlement and a trading post; prosperity arose from the building of "prairie schooner" wagons for immigrants moving W., and it became a town in 1835. Aircraft, motor cars, sewing machines, and farm implements are manufactured. South Bend is the seat of the R.C. university of Notre Dame. Pop. 101,268

Southborough. Urban dist. of Kent, England. It is 2 m. N. of Tunbridge Wells and 33 m. S.E. of London, having a rly. station. With its chalybeate spring, it is mainly a residential area. Pop. est. 8,750. There is another Southborough in the same county, on Bromley common.

South Carolina. An Atlantic state of the U.S.A., and one of the 13 original states of the Union. Its area is 31,055 sq. m., rather more than that of Scotland. The surface rises from a low and level coast belt, largely under pinewood, to a height of more than 3,500 ft. in the W., where it is broken by mountain spurs of the Appalachian system. The coast is barred in parts by islands separated by narrow straits. The principal navigable rivers, all of which follow a S.E. course, are the Santee, formed by the confluence of the Congaree and Wateree, the Great Pedee (lower course), and the Savannah, which forms nearly the whole of the W. frontier.

S. Carolina is an outstanding recreational centre—the state with the longest open hunting season, and one in which the fishing season is never closed. It has 16 state parks with an area of 34,753 acres. The cotton crop excels all others in importance. Other products include tobacco, rice, maize, sweet potatoes, peanuts, peaches, and oats. Phosphate rock and granite are worked; oysters, whiting, and shad caught; cotton goods and lumber products, notably turpentine, manufactured. Until 1949 divorce was not allowed.

The Old Exchange Building in Charleston housed the first independent government established in U.S.A., which the S. Carolinians set up in 1774 during the revolutionary period. S. Carolina's secession from the Union, voted by her people in convention on Dec. 20, 1860, brought about the outbreak of the Civil War. The university of S. Carolina and 14 other institutions provide higher education. Two senators and six representatives are sent to congress. The capital is Columbia. Pop. 1,899,804, of whom 814,164 are negroes. *Consult* History of S.C., 4 vols., D. D. Wallace, 1934.

Southcott, JOANNA (1750–1814). English religious fanatic. Born at Gittisham, Devon, she was a domestic servant and shop assistant. Having joined the Methodists, about 1790 she began to write prophecies which attracted attention. Her followers became numerous, and in 1802 she settled

in London, where she began to “seal” the 144,000 elect. About this time a chapel was opened for her followers, and Joanna put forward the idea that she was about to become the mother of Shiloh, the second Christ (Rev. 12). Great preparations were made for the event, but on Oct. 29, 1814, she died of brain fever. Several collections of Joanna's prophecies are published, and a box said to hold others was the object of much interest until when opened it was found to contain junk. Her followers formed a religious sect, still existing in the 20th century.

South Dakota. North-central state of the U.S.A.; area, 77,047 sq. m., a million acres of which are



Joanna Southcott, religious fanatic



South Downs. A stretch of these English chalk uplands near Alfriston, Sussex

the Big Bad Lands, an expanse of ravines, clay bluffs, and no vegetation. The Grand, Moreau, Cheyenne, and Bad rivers in the W., and the James and Big Sioux in the E., are all tributary to the Missouri, which divides the state into two almost equal parts. The Black Hills, in the extreme W., rise to Harney Peak (7,242 ft.), the highest mt. E. of the Rockies. In these hills are found fossil deposits and archeological remains of a well organized prehistoric society. The “coyote state” is largely occupied with agriculture. Maize, wheat, oats, barley, rye, flax, potatoes, and some hardy fruits are grown, and the chief industry is processing these products. Among minerals gold and silver are mined most extensively; at Lead is the largest gold mine in the U.S.A. The state (admitted to the Union in 1889, and sending two senators and two representatives to congress) has a university, college of agriculture and mechanic arts, and school of mines. Pierre is the capital. The pop. is declining, for the 1940 census showed 642,961, and an est. of 1947 gave 564,000. Some 23,000 Indians have eight reservations.

South Downs. Range of English chalk uplands extending 60 m. E.S.E. from the W. borders of Sussex near Midhurst to the sea at Beachy Head. The downs once formed one range with the North Downs, but erosion has divided them by a lowland area, the Weald. They are breached by the rivers Arun, Adur, Ouse, and Cuckmere, and reach their highest point at Duncton Beacon (837 ft.). Rolling turf-covered hills provide fine scenery, and between them are unspoilt villages. Among well-known beauty spots are Devil's Dyke and Chancetonbury Ring. From Brighton the downs form a series of cliffs stretching E. to Beachy Head. In many places are earthworks and barrows built by the ancient Britons. Lewes, the co. town of E. Sussex, is in the midst of the downs.

The Southdown breed of sheep was brought to perfection by John Ellman (1753–1832), a farmer from Glynde.

South-East Asia Command.

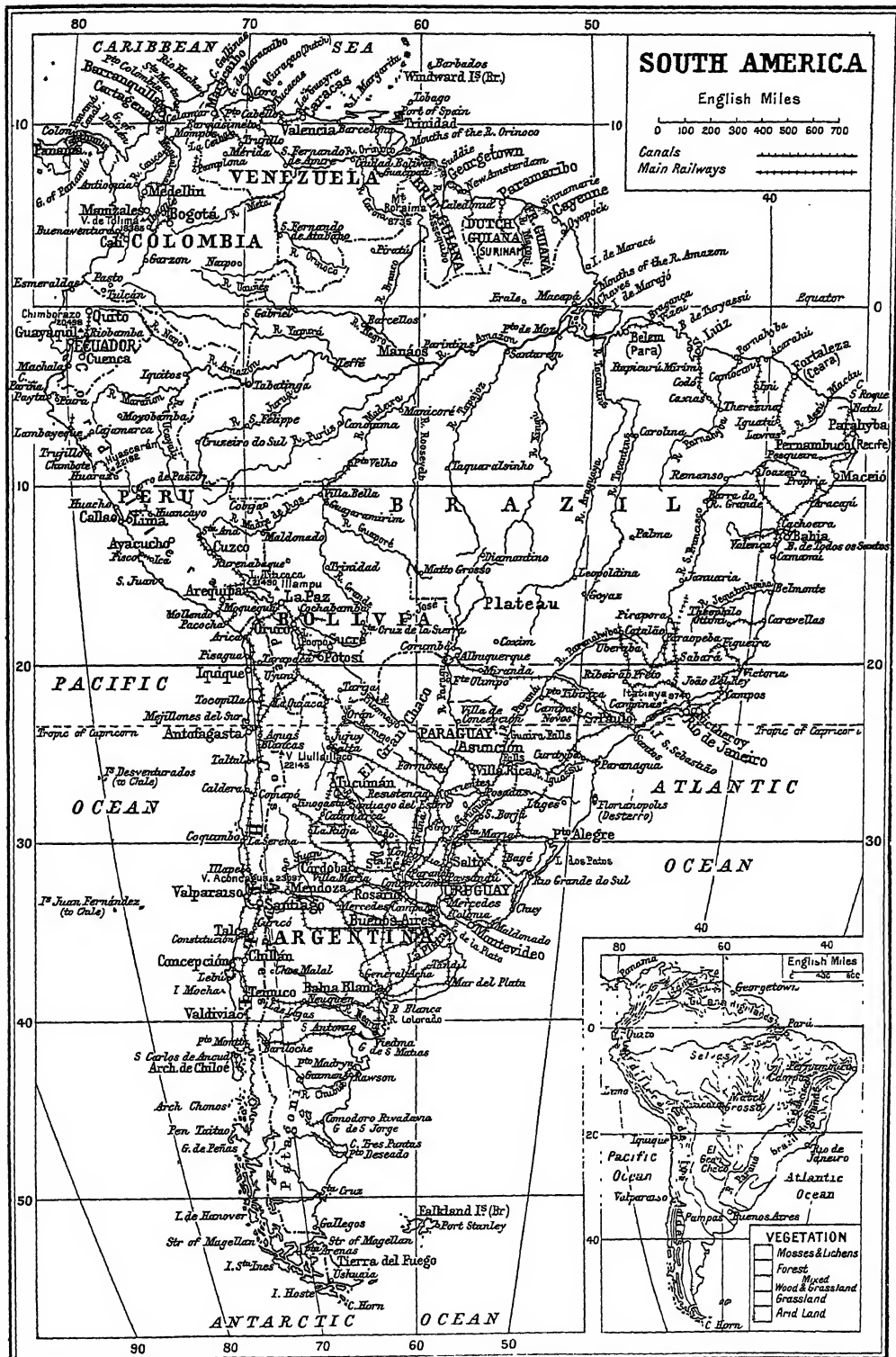
Authority in the Second Great War, set up on Aug. 24, 1943, after a meeting at Quebec between Winston Churchill, President Roosevelt, and T. V. Soong. With h.q. at New Delhi, and Lord Louis (later Earl) Mountbatten as the supreme Allied commander, S.E. Asia, it had as function coordination of all Allied land, sea, and air operations in Burma and Malaya, extended in Aug., 1945, to Indo-China and the Netherlands Indies. Gen. Stilwell (g.v.) was deputy supreme commander March–Oct., 1944. Mountbatten moved his h.q. to Kandy in Ceylon (which was under SEAC) April, 1944, and to Singapore Nov. 22, 1945. SEAC was dissolved Dec. 1, 1946.

Southend-on-Sea. County borough and seaside resort of Essex, England. It is on the N. bank of the Thames estuary, 36 m.

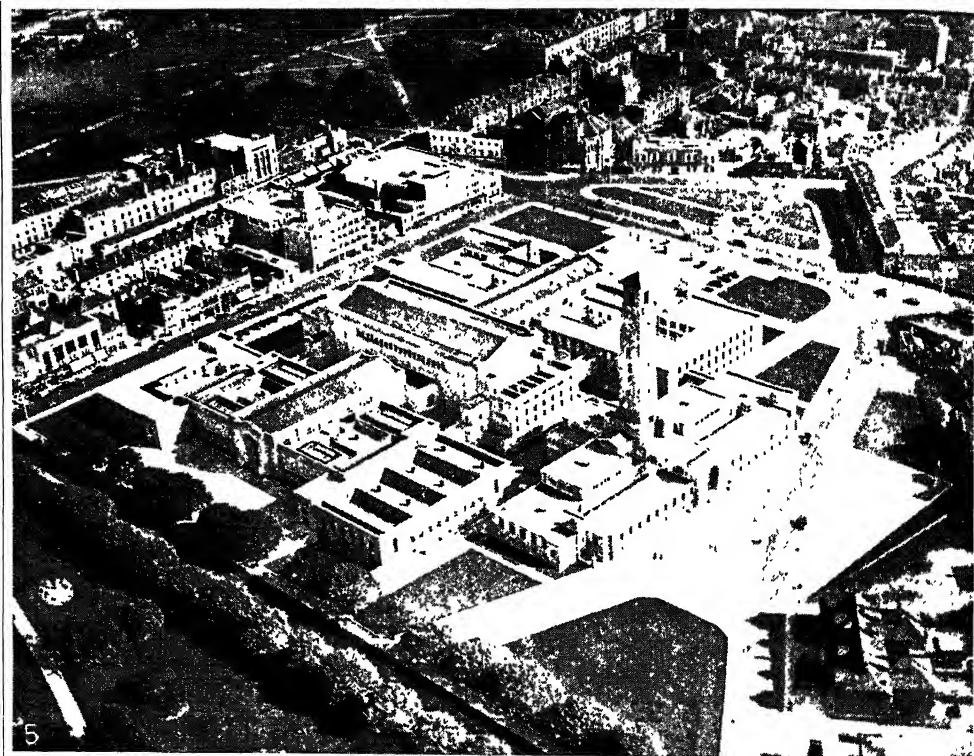
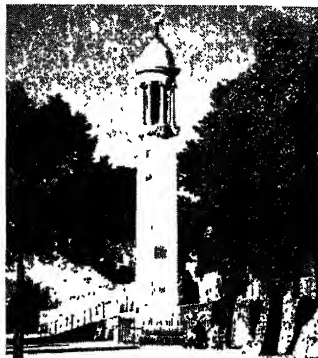
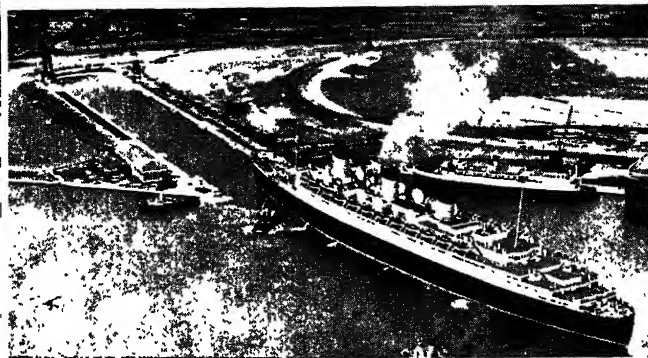
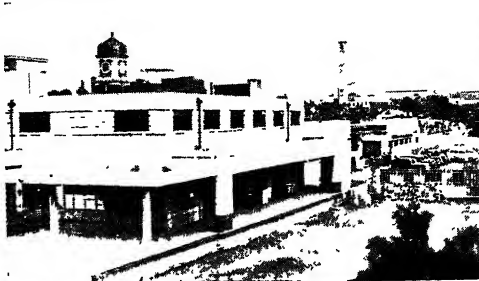


Southend arms

E. of London by rly., also connected by electric rly. with London's underground service (District line). Southend-on-Sea includes Westcliff, Thorpe



Fuller topographical details in the larger scale maps are given under the headings of the various countries



1 Central rly. station. 2 Bargate, north side, a post-war view. 3. R.M.S. Queen Mary entering the King George V graving dock. 4. The Pilgrim Fathers' memorial on the Western esplanade, commemorating

their departure in the Mayflower in 1620. 5 Air view of the Civic Centre (consisting of Guildhall, law courts, municipal offices, libraries and art galleries) as it appeared in 1939, before being partly damaged in German air raids

SOUTHAMPTON: HISTORIC SEAPORT ON THE ENGLISH SOUTH COAST. See p. 7674



Southend-on-Sea, Essex. An air view of this popular seaside resort on the Thames estuary

Bay, Shoeburyness, and Leigh-on-Sea. Features of Southend are a pier nearly $1\frac{1}{2}$ m. long, 7 m. of sea front and promenade, a swimming pool, wide sands, wooded cliffs, 16 pleasure grounds totalling 600 acres, amusement park, and sporting events which include a yachting week in July. During 1946 Southend had over 4 million visitors.

There are radio, electrical, and light engineering industries, plastics, textile, and furniture manufactures, brickmaking, boat building, and fishing. Until the beginning of the 19th century Southend was a village, but a bracing climate made it popular with Londoners. Buildings of interest in the neighbourhood are the 12th century priory at Prittlewell, and a ruined castle at Hadleigh. Southend was made a bor. in 1892, and a co. bor. in 1914. Up to 1950 it had one M.P., thereafter two. Pop. est. 147,410.

Southerly Burster. Strong, often violent, S. wind following a depression in S. and S.E. Australia, especially on the coast of N.S.W. It is accompanied by a sudden fall in temperature, sometimes 30–40° F. in 30 minutes, and frequently ends a Sydney heat wave. A well-defined roll of cumulus cloud with heavy rain, and sometimes thunder and lightning, are associated with the burster. These storms, most prevalent from Oct. to March, are similar to the line squalls of higher latitudes. See Squall.

Southern Alps. Mountain range of S. Island, New Zealand. It forms the backbone of the island for a length of more than 300 m. W. the mts. slope steeply through the forests to the Tasman Sea; E. lie the Canterbury Plains. Many glaciers feed the Waitaki, Rakaia, Waimakiriri, Hurunui, and other streams. The Tasman Glacier is one of the largest outside the polar

regions; others are Mueller, Hooker, Murchison, and Godley. Wakatipu, Wanaka, and Hawea are lakes of glacial origin. The range is snow-capped, and rises to Mt. Cook 12,349 ft. S.W. the range reaches the coast among the fjords, Milford Sound, etc. The Otira Gorge is the only easy passage through the range, which is one of

the finest mountainous tourist resorts in the S. hemisphere.

Southern Cross. Striking figure visible in the southern heavens, and formed by the four bright stars α , β , γ , and δ Crucis. The long arm of the cross (joining γ to α), if extended about five times its own length, passes close to the position of the S. pole of the sky, which is, however, not marked by any bright star. The Southern Cross is represented on the national flag of Australia.

Southerne, THOMAS (1659–1746). English dramatist. Of his comedies and tragedies, only the latter have any merit. The best are *The Fatal Marriage*, 1694, and *Oroonoko*, 1696, a vehement attack upon the slave trade. He died May 22, 1746. *A Life*, by J. W. Dodds, appeared in 1933.

Southern Railway. Former British railway company. Established in 1923, it was an amalgamation of the London and S.W.; London, Brighton and South Coast; S.E. and Chatham; and several smaller companies. The principal London termini were Waterloo, the largest station in Great Britain, handling 1,550 trains daily; Victoria; London Bridge; Cannon Street; and Charing Cross. Route mileage, 2,186, was less than one-eighth of the British main line total, but the Southern carried the densest traffic of any company, and over 25 p.c. of the passengers. It had 447 m. of electrified track by 1947, and carried the heaviest suburban traffic in the world. Covering the whole S. coast from Margate to Plymouth, the company sent electric trains as far as Portsmouth, and steam services into Cornwall and Devon. It had an extensive seaborne trade and Anglo-Continental traffic, owning 46 steamers. It ran the Golden Arrow express from London to

Paris and maintained two train ferries on cross-Channel routes. The company owned docks at Southampton, and ten large hotels in London and the provinces. In both Great Wars it carried the bulk of the troops and stores to the Continent. In 1948 it was absorbed into British Railways.

Southern Rhodesia. Self-governing British colony in S. central Africa, between 15° 30' and 22° 30' S. lat., and 25° and 33° E. long. Its area of 150,333 sq. m. is bounded on the N. by the river Zambezi, with Northern Rhodesia beyond; on the S. by the river Limpopo, with the prov. of Transvaal beyond; on the E. by Mozambique; and on the W. by the Bechuanaland Protectorate. It lies wholly in the tropics, on a plateau from 3,500 to 5,500 ft. in height, rising to a mountain range with peaks from 6,000 to 8,000 ft. high towards the E. The climate is generally suitable for European settlement, except in the hot and humid parts of the river valleys.

HISTORY. The area now called Southern Rhodesia is of immense antiquity, geological evidence pointing to the existence of human beings here at a much earlier period than in Europe or Asia. In the 15th and 16th centuries Portuguese missionaries and explorers reached the Rhodesian plateau, the first to take Christianity to the unusually savage and primitive tribes, and the second to seek the fabulous treasures supposed to be buried there. Neither the explorers nor the missionaries succeeded in their quest, and for another 200 years central Africa remained the "dark continent," a completely unknown and legendary land. It was left to the Scottish missionary Moffat, father-in-law of David Livingstone, to reawaken curiosity in the region. He established the first mission among the Matabele, a strong, warlike tribe, who waged constant warfare on their neighbours, particularly on the peaceful pastoral tribes of Mashonaland.

Great Britain, Germany, Italy, Portugal, Belgium, and the Transvaal republic all became competitors for a share in the unoccupied lands of central Africa. At first Great Britain was only mildly interested, and without the faith and pertinacity of Cecil Rhodes, Rhodesia might never have been included in the Commonwealth. On Oct. 29, 1889, he obtained from the British govt. a royal charter incorporating the British South Africa co. and conferring on it certain limited powers of administration



Southern Rhodesia. Map of the whole of Rhodesia, comprising Northern and Southern Rhodesia

over the territory between the Limpopo and the Zambezi. The area now Northern Rhodesia also came under the jurisdiction of the co.

Rhodes, who had obtained valuable concessions from Lobengula, chief of the Matabele, organized a pioneer column which marched from the border of Bechuanaland through trackless and difficult country, arriving at the site on which Salisbury now stands, Sept. 12, 1890. After several conflicts with the native inhabitants, notably the Matabele wars of 1893 and 1896, the pioneers triumphed, and since that time the relations between the different peoples of the area have been uninterruptedly harmonious.

For thirty years the average increase of the white pop. was about 1,030 per annum. The settlers built rlys., laid out towns, located the major mineral deposits, and began to develop both the mines and agriculture.

The British South Africa co., whose main commercial interests were transport, mining, and agriculture, paid its first dividend in 1923. It administered the country justly and with a view to its

development until its administrative charter was ended and Southern Rhodesia was formally annexed, Sept. 12, 1923; the settlers, given the choice of local autonomy or of accepting generous terms offered by Gen. Smuts to join the Union of South Africa, decided by referendum in favour of responsible government, which was established on Oct. 1.

ADMINISTRATION. Although a self-governing colony, Southern Rhodesia deals with the office of Commonwealth Relations in London. She has full control over her own internal affairs except in legislation affecting the native population.

The legislative assembly has 30 elected members and a speaker; there is no upper chamber, though provision exists for the creation of one if necessary. There is a cabinet, led by a prime minister, the other portfolios being native affairs; finance; internal affairs; mines and public works; commerce and industries; agriculture and lands; justice; works; and defence and air. The king is represented by the governor, who is also c.-in-c.

All British subjects, irrespective of sex or colour, are entitled to vote, provided they have resided six months in the country, occupy premises to the value of £150, have an income of not less than £100 a year, or own a registered mining location. In practice, this means that few natives have the vote. At the general election of 1946, the United party under Sir Godfrey Huggins, who first became prime minister in 1933, was returned with 14 seats, against 11 held by the Liberals and five by the two Labour groups.

In 1921 there were fewer than 34,000 European and about 899,000 native inhabitants. In 1948 the est. European pop. was 110,000, the native about 1½ millions. Coloured persons and Asiatics numbered 8,500. Land set aside for tribal settlements covers 21,127,040 acres, for native purchase 7,859,942 acres.

RESOURCES AND TRADE. The country was built up on gold mining, and gold remains important in its economy. There are also rich coal deposits, the field at Wankie being outstanding. Other natural assets include a large deposit of iron ore at Que Que, under govt. exploitation, and deposits of asbestos, chrome, and mica. Much land is suitable for agriculture and cattle rearing. In 1946 the total value of exports, 79 p.c. to British countries, was £16,586,000, chief items being tobacco leaf, gold bar, and chrome. Imports, 76.9 p.c. from British countries, were valued at £20,744,000, chief items being metals, manufactures, vehicles, yarns and textiles, food-stuffs, leather and rubber manufactures.

The govt.-controlled rlys. reach Northern Rhodesia at Victoria Falls, thence run to the Belgian border, and also link with Beira and the S. African rly. system. A line from Broken Hill to Tanganyika was begun 1949. There is a state air service.

In the two Great Wars Southern Rhodesia was responsible for her own defence and made substantial contributions in men and money to British forces. During the Second, she participated in the Commonwealth air training scheme; out of 19,000 European citizens of military age, more than 10,000 (including 1,400 women) joined the military forces of the Commonwealth; two Rhodesia squadrons served with the R.A.F.

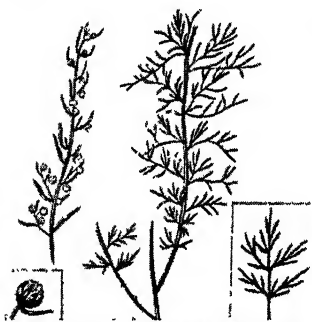
The chief towns are Salisbury (pop. 69,049, including 21,293 Europeans), Bulawayo (51,698, in-

cluding 17,317 Europeans), Gwelo, Umtali, Que Que, Gatooma, and Wankie.

Walter C. Smith

Bibliography. Southern Rhodesia, P. F. Hone, 1909; Lobenguela, H. M. Hole, 1929; Rhodesia and Eastern Africa, ed. A. Macmillan, 1930; Rhodes Goes North, J. E. S. Green, 1936; The Making of Rhodesia, H. M. Hole, 1936; Matabele Journals, R. Moffat, 1943; Matabele Mission, G. S. and E. Moffat, 1945.

Southernwood (*Artemisia abrotanum*). Shrubby perennial plant of the family Compositae. Growing native in Europe, it has insignificant flowers, but the plants are favoured because of their fragrant, feathery, hair-like foliage. In various parts of England it is known as old man, old woman, or lad's love. It may be raised from seed sown in March, or from cuttings, or from division of the roots taken later in the year. It will flourish in any open and unconfined position. See *Artemisia*.



Southernwood. Left, spray of flowers; right, sweet smelling leaves. Inset, left, flower-head; right, leaf

Southey, ROBERT (1774-1843). English poet and historian. He was born at Bristol, Aug. 12, 1774, the son of a linen draper, and went to Westminster and Balliol College, Oxford. Influenced by the French Revolution, Southey developed advanced ideas in politics and religion, and with Coleridge, whom he met in Oxford in 1794, cherished vain dreams of establishing a Pantisocracy or communal republic in the New World. Southey's advanced ideas were reflected in early literary efforts, *Wat Tyler*, a drama, and *Joan of Arc*, an historic epic. A trip through Spain and Portugal, 1795-96, inspired him with lifelong interest in those countries. *Thalaba the Destroyer*, a Mahomedan epic in irregular blank verse, was published in 1801.

By 1803 Southey had settled down to literature in earnest at



Robert Southey

Greta Hall, Keswick. He had married one of the three Misses Fricker, Coleridge marrying another. The Lake District was chosen as a place of residence on account of Southey's friendship with Coleridge; this intimacy was not to last, but at Keswick appeared a new friend in Wordsworth. A romantic Welsh epic, *Madoc*, was published in 1805; *The Curse of Kehama*, an epic of Hinduism, in 1810; and an historic epic, *Roderick, the Last of the Goths*, in 1814. Years of continuous overwork affected Southey's health, and when he died, March 21, 1843, he had been insane three years. Early republicanism having gradually changed to Toryism, he had been appointed poet laureate in 1813, and for two separate periods was in receipt of a government pension of £160, later £300.

Southey's output was prodigious, but his only enduring work is his *Life of Nelson*, 1813, written in lucid and direct prose. The same qualities are to be seen in his miscellany *The Doctor*, 1834-37. His prose works also include *Life of Wesley*, 1820; *History of the Peninsular War*, 1823-32. Much of his verse is dull and unimaginative,

but *After Blenheim* holds its place as a recitation; *Lodore* is a *tour de force* in rhyming; and there is nobility in the lines beginning, *My days among the dead are passed*.

Bibliography. *Poetical Works*, new ed. 1850; *Selected Poems*, 1895; *Life and Correspondence*, ed. C. C. Southey, 1849-50, Correspondence with Caroline Bowles, ed. E. Dowden, 1881; *Lives*, E. Dowden, new ed. 1895; J. Dennis, new ed. 1895; J. Simmons, 1845.

South Foreland, Cape of Kent, England. See *Foreland*, N. and S.

Southgate. Mun. bor. and bor. constituency of Middlesex, England, 1½ m. N.E. of New Southgate rly. station. It was the S. gate of Enfield Chase. Christ Church, 1863, is on the site of a chapel built in 1615 by Sir John Weld, of Arno's Grove, or Arnold's, later Minchenden. To the S. are Broomfield Park and Grovelands Park. Part of the dist. was in 1873 united with Colney Hatch (*q.v.*) to form New Southgate, and the Gothic church of S. Paul erected. Leigh Hunt was born at Southgate, and the lanes between Southgate and Colney Hatch were haunts of Charles Lamb. Pop. est. 74,000.

South Georgia. British island in the S. Atlantic Ocean. Situated 800 m. E. by S. of the Falkland Islands, of which it is a dependency, it is mountainous, from 6,000 to 8,000 ft. in elevation, with glaciers descending the gorges on the mountain slopes. It is uninhabited except for the whaling settlement, and is a sealing ground. Discovered in 1775 by Cook, it was visited in 1882-83 by a German scientific expedition to observe the transit of Venus. Here Sir Ernest Shackleton (*q.v.*) was buried in 1922. Ownership of Falkland Islands and their dependencies was disputed with the U.K. by Argentina from 1936 and by Chile from 1939. Area, est. 1,000 sq. m. Pop. est. 360. See *Antarctic Exploration*, p. 480.



South Georgia. Whaling station and mountains of Grytviken, from the sea, in the island at the gate of the Antarctic where Shackleton died and was buried

South Holland. Province of the Netherlands. See Holland. p. 4271.

South Island. Largest of the New Zealand islands. It lies between North and Stewart Islands, and has an area of 58,093 sq. m. The S. Alps form a mountainous backbone; E. of them lie the Canterbury Plains, the chief wheat-growing area in the dominion. Oats are grown in the S., and sheep are reared in the E.; dairy farming is profitable. Coal is mined in the N.W. South Island includes the districts of Marlborough, Nelson, Westland, Canterbury, and Otago, and the chief towns are Christchurch and Dunedin. Pop. est 600,000. See New Zealand.

South Lancashire Regiment. Unit of the British army. Formed in 1881 by an amalgamation of



South Lancashire Regiment badge

it adopted its present title.

Raised in 1717, the 40th Foot served in America until 1747. It then went to the W. Indies and fought at Martinique and St. Lucia. It was with Abercromby in Egypt in 1801 and then moved to the Peninsula, where twelve honours were won. It served in the American War of 1812, returning to Europe in time for Waterloo. The 82nd Foot was formed in 1793 and fought in the Peninsula. Thereafter both regiments served together in the Afghan War of 1842 and against the Mahrattas. Three honours were won in the Crimea and two in the Indian Mutiny. Both regiments took part in the Maori War of 1860-65. In the S. African War the Prince of Wales's Volunteers were with the Ladysmith relief force, and earned much distinction in the fighting for the Tugela Heights.

Twenty battalions were raised for service in the First Great War and, fighting on four fronts, earned the honours: Mons; Aisne, 1914, '18; Messines, 1914, '17, '18; Ypres, 1914, '15, '17; Somme, 1916, '18; Lys; Dorian, 1917, '18; Sari Bair; Bagdad; Baluchistan. In the Second Great War South Lancashire battalions served in India, Madagascar, N. Africa, and Burma. The regimental depot is at Warrington.

Southland. Former prov. of South Island, New Zealand. It has been merged in Otago (*q.v.*).

South Orkneys. Group of uninhabited British islands in the S. Atlantic Ocean. It is a dependency of the Falkland Islands, from which it is 790 m. to the S.E. Coronation Island is the largest. On Laurie Island the Argentine government maintains the magnetic and meteorological station established and occupied, 1902-04, by the Scottish Antarctic expedition. In 1948 the Argentine govt. made claims to sovereignty over the S. Orkneys similar to those put forward by Chile in the South Shetlands (*q.v.*). The group, discovered by George Powell in 1821 originally bore his name. Area, 800 sq. m.

South Pole. Lat. 90° S., one terminus of the earth's axis. It lies on an elevated plateau, covered by an ice sheet, and was first reached by Amundsen and Scott. It does not coincide with the S. magnetic pole, which is in position 71° 10' S., 150° 45' E. See Antarctic Exploration.

Southport. Co. and mun. borough and seaside resort of Lancashire, England. It stands at the mouth of the Ribble estuary, 18 m. N. of Liverpool by rly. The buildings, all modern, include the town hall, Cambridge hall, market halls, free



Southport arms

library, Atkinson art gallery and museum. There are a promenade, 3 m. long, a pier with an electric tramway, two theatres, and on the front a marine lake 1 m. long. The winter gardens contain a theatre, aquarium, and conservatory. Other favourite resorts are the botanic gardens, Princes Park, Hesketh Park, and Kew Gardens.

Southport developed wholly after 1800, and became a popular watering-place in the 19th century. In 1867 it was made a borough in 1905 a co. borough, and in 1918 a parl. borough returning one member. In 1912 it was extended to include the urban dist. of Birkdale, which lies to the S.

Market days, Wed. and Sat. Pop. est. 84,820.

Southsea. English holiday resort on the Hampshire coast. It is part of the city of Portsmouth (*q.v.*).

South Sea Arrowroot (*Tacca pinnatifida*) Perennial herb of the family Taccaceae. A native



South Sea Arrowroot. Spray of foliage and, right, tubers from which arrowroot is obtained

of the East Indies and Society Islands, it has tuberous rootstocks, like those of the potato, and rich in starch. The large leaves are cut into oval segments, and the greenish funnel-shaped flowers are clustered in a dense umbel, succeeded by large, pear-shaped, ribbed fruits. Strips of the leaves are plaited into hats, but the chief economic value of the plant is its yield of starch, obtained by rasping the tubers and macerating the material in water, the deposit being a fine kind of arrowroot (*q.v.*).

South Sea Bubble. Popular name given to a group of speculative financial schemes in England resulting in a crisis in 1720. In 1711 the Tories wished to have the financial support of a great commercial company to counter-balance the Whig Bank of England and East India Company; and the South Sea Company was started, having secured to it, under



Southport, Lancashire. Lord Street, the main thoroughfare, one of the most spaciouly planned streets in the British Isles

government guarantee, actual or anticipated commercial rights in consideration of which it took over £9,000,000 of the national debt, with the interest thereon secured upon the proceeds of certain specified taxes. Soon afterwards England and Europe generally were seized with an epidemic of speculation. In 1719 the company obtained further commercial concessions from the government, and proposed to take over the whole of the national debt, and to advance £7,500,000 to the government.

The scheme in itself was perhaps rash, but was at least sane. But unfortunately the speculative mania was at its height; the public was taught to believe that South Sea stock would yield enormous profits. Ministers used their position to share in the gamble. In spite of Walpole's warning the shares raced up. Everyone, rich or poor, scraped together every available penny to buy South Sea stock at any price. In the first six months of 1720 the price of £100 shares rose to £1,100; then a whole series of fraudulent companies suddenly collapsed.

The public soon took alarm, and in three months the shares had fallen to £150. Vast numbers were ruined, the government was driven from office as having been responsible, and Walpole was called in to remedy the disaster. About £2,000,000 was raised by the forfeiture of the property of directors and other persons who had made nefarious profits out of the transaction, the government resumed the national debt, and the company was reconstituted on a sober basis. *Consult The South Sea Bubble, L. Melville, 1921.*

South Shetlands. Group of uninhabited islands in the Antarctic Ocean. A British possession, the group forms a dependency of the Falkland Islands, covers 880 sq. m., and is 580 m. S.S.E. of Cape Horn. Clarence, Elephant, and Deception are the chief islands, which are mostly mountainous. Mt. Foster, on Smith Island, reaches 6,600 ft. The group is a great centre of the sealing industry. Discovered and explored, 1819-22, it was proclaimed a British possession in 1908. In 1947 a Chilean warship set up a permanent post on Greenwich Island in support of Chile's claim to sovereignty over the islands. Other bases were established in 1948. When Chile refused to submit the disputed

sovereignty to international arbitration the British govt. instructed the authorities in the islands to take all legal measures to safeguard the British title.

South Staffordshire Regiment. Unit of the British army.

It was formed in 1881 by an amalgamation of the 38th and 80th Foot. The 38th was raised in 1702 and first saw active service two years later with Rooke at the capture of



South Staffordshire Regiment badge

Gibraltar. For 60 years the regiment was in the W. Indies, gaining the honours Guadeloupe (1759) and Martinique (1762). It then moved to India, and remained there until the Napoleonic Wars, when it formed part of Abercromby's force in Egypt. Drafted to the Peninsula, it won ten battle honours under Wellington. In 1818 the 38th went to Cape Colony under Col. Graham; in the following year it defeated a large force of Kaffirs, and in recognition of the regiment's gallantry the site of the action is called Grahamstown.

Raised in 1793, the 80th Foot joined the 38th in the Peninsula and served until the end of the campaign. Both regiments fought in the Crimean War, Indian Mutiny, and Zulu War of 1878-79. After amalgamation in 1881 they served in the Egyptian campaign of 1882-85 and the S. African War. Eighteen battalions were raised for service in the First Great War, earning the honours: Mons; Marne, 1914; Aisne, 1914, '18; Ypres, 1914, '17; Loos; Somme, 1916, '18; Cambrai, 1917, '18; St. Quentin Canal; Vittorio Veneto; Suvla. In the Second Great War, battalions fought in France (1940), N. Africa, Italy, Burma, and N.W. Europe. The depot is at Lichfield.

South Victoria Land. Section of the Antarctic continent. It lies W. of the Ross Sea, in about 160° E. long., and stretches S. from Cape Adare. Near the sea and the Ross barrier ice it is mountainous. The N. coastal portion is deeply indented, and the S. portion cut off from the E. by a great fissure in the barrier ice. *See Antarctic Exploration.*

South Vietnam. Name given in 1949 to the territory of S.E. Asia formerly called Cochinchina (*q.v.*).

South Wales Borderers. Regiment of the British army.

Raised in 1689 as the 24th Foot, the regiment served under William III in Ireland and Flanders, and was in all Marlborough's major battles. It was at the defence of Minorca in 1756, and served throughout the Seven Years' War and the American War of Independence. The regiment gained its sphinx badge under Abercromby in Egypt in 1801, and took part in the capture of the Cape of Good Hope in 1806. In the Peninsular War it won nine battle honours and particular distinction at Burgos and Talavera. Further honours were gained in the Sikh War in 1848-49 and on the N.W. Frontier.



South Wales Borderers badge

Greatest day in the regiment's history was Jan. 22, 1879, when, although the 1st battalion was annihilated by the Zulus at Isandhlwana, a single company of the 2nd battalion defended Rorke's Drift (*q.v.*) against an enemy force 3,000 strong. Ten officers and others were awarded the V.C. in this campaign. To recognize the regiment's record in the Zulu War, Victoria granted it the wreath surrounding the badge. Similar wreaths in silver are carried on the staves of the regimental and king's colours. The regiment fought throughout the Burmese War of 1885-87 and the S. African War.

Eighteen battalions of the South Wales Borderers were raised for service in the First Great War and went to France, Macedonia, Gallipoli, and Mesopotamia, winning the battle honours: Mons; Marne, 1914; Gheluvelt; Somme, 1916, '18; Cambrai, 1917, '18; Dorian, 1917, '18; Landing at Helles; and Bagdad. In the Second Great War, battalions served in Norway, Iraq, N. Africa, India, Burma, and the liberation of Europe. The Monmouthshire Regiment (*q.v.*) forms Territorial battalions, and the regimental depot is at Brecon.

Southwark. A metropolitan borough of the co. of London. In the co. of Surrey, it is bounded N. by the Thames, S. by Camberwell, E. by Bermondsey, and W. by Lambeth. It is connected with the City of London by Blackfriars. Southwark, and London bridges, important road junctions being at St. George's Circus, and the Elephant and Castle. The name derives from the southward works or

fortifications of London, and in early times Southwark was the site of a Roman, and probably of a Danish, colony. Known as the Borough, since 1551 it has been a ward of the City of London — Bridge Ward Without. Here were Bankside (q.v.) and the 16th and 17th century pleasure ground known as Paris Garden. Its inns were famous, e.g. The Tabard of The Canterbury Tales, and the many coaching hosteleries of the 18th and early 19th centuries. Its prisons, its



Southwark arms



Southwark. The cathedral church of S. Saviour's, from the south. It dates from the early 12th century, and was restored in the late 19th

century," and its fair, which existed from 1462 to 1763, were notorious.

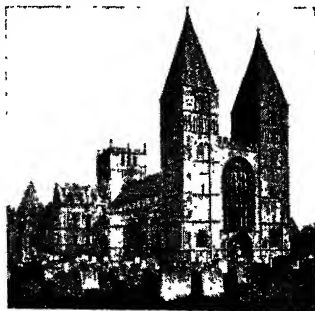
The seat of a bishopric from 1905, its most notable building is the cathedral church of S. Saviour. It was founded, according to tradition, as the church of a convent, by Marie Audery, daughter of a ferryman, and dedicated to the Virgin. Turned into a college for priests by Swithun, bishop of Winchester, in the 9th century, the buildings were reconstituted as an Augustinian monastery in 1106, when the church was built in the Norman style. Known as S. Mary Overy's or Overy's (*ofer*, bank; *rie*, river) until the Reformation, it was later known as S. Saviour's, and restored by Bishop Thorold in the 1880s, the renovated and partly rebuilt fabric being reopened in 1897. The pinnacled tower is 35 ft. sq. and 150 ft. high. Tombs include those of John Gower and Lancelot Andrewes. There are memorial windows to Shakespeare

and other dramatists associated with Southwark; a Shakespeare memorial chapel was opened in 1912. The chapel E. of the N. transept was restored in 1907 in memory of John Harvard. The Early English Lady chapel which replaced the chapel demolished in 1830 serves as the parish church.

Other notable buildings include S. George's church, rebuilt 1734-36, on the site of the church in which Gen. Monk was married to Anne Clarges; S. George's R.C. cathedral, 1840-48; the Metropolitan tabernacle; Guy's hospital. In Summer Street is one of the largest printing works of the Amalgamated Press (q.v.). The market, mainly for fruit and vegetables, dates from the time of Edward VI. Southwark Bridge, opened June 6, 1921, has five arches, and replaced a bridge built 1815-19. Southwark Park, 63 acres, opened in 1869, is in Rotherhithe (q.v.).

An industrial centre, Southwark was formerly one of the most populous, and perhaps the poorest area in the country. It suffered heavily as a result of German air raids during the Second Great War, particularly in the neighbourhood of the Elephant and Castle. In 1950 its M.P.s were reduced from three to one. Pop. est. 96,000. See Bankside; Globe Theatre; Harvard, John; London; consult also Old Southwark and Its People, W. Rendle, 1878; Sketches of Southwark, R. W. Bowers, 1902.

Southwell. A city of Notts, England. It is 14 m. N.E. of Nottingham, with a rly. station, and has some manufacturing industries. The cathedral, or minster, dates mainly from the 12th century. It is a beautiful cruciform building, with Norman nave and towers and Early English choir. The chapter house is especially notable. The grammar school dates from the 16th century. Southwell was in 1884 made the



Southwell, Nottinghamshire. West front of the 12th cent. minster, made a cathedral in 1884

seat of a bishop. The diocese covered the counties of Nottingham and Derby until the diocese of Derby took away the latter. Pop. 2,991.

Southwell, ROBERT (1561-95). English Jesuit and poet. Born at Horsham St. Faith, Norwich, and educated at Douai and Paris, he was in 1577 received into the Society of Jesus at Rome, where he became prefect of the English college. Ordained priest



Robert Southwell, English Jesuit
After H. C. Vroom

in 1584, he returned to England in 1587 to minister to his co-religionists in defiance of the Act excluding English-born R.C. priests from the kingdom, and became chaplain to the countess of Arundel. Betrayed in 1592, he was cast into the Tower, racked 13 times, and hanged at Tyburn, Feb. 21, 1595. Of his poems, the longest is Saint Peter's Complaint, and the best known The Burning Babe, which Jonson praised to Drummond. Consult Robert Southwell the Writer, P. Janelle, 1935.

South-West Africa. Territory in Africa, formerly German, mandated in 1920 by the League of Nations to the Union of S. Africa. By the S.W. Africa Affairs (Amendment) Act, 1949, the Union assumed full powers of government. See N.V.

The territory has an area of 322,460 sq. m. It lies between Angola on the N. and the province of the Cape of Good Hope on the S., the Orange river being the boundary there. On the E. are the Bechuanaland Protectorate and British Bechuanaland, while W. lies the Atlantic, with a coastline of about 800 m. Walvis Bay, a small enclave on the coast, belongs to the Cape, as it did when this region was German. Windhoek, 180 m. inland from Swakopmund, is the chief town; others are Swakopmund, Seeheim, Karibib, Keetmanshoop, and Tsumeb. The chief harbours are at Swakopmund and Lüderitz Bay, but neither is as good as Walvis Bay.

The pop. is est. at 307,589. Many are Hottentots and Bushmen, while others belong to the Bantu group. The N. central part of the country is sometimes called Damara-land or Hereroland, N. of it is Ovambo, and S. is Great Namaqualand. In 1925 a constitution,

providing for an executive council, an advisory council, and a legislative assembly, was granted. Since 1947 S.W. Africa has sent representatives to the Union parliament. (See N.V.)

Most of the territory is barren and waterless, especially in the N. and E. Along the coast is a level, sandy strip 60 m. wide, which gives way to a mountain range with peaks nearly 9,000 ft. high. Farther inland is the Waterberg range, while the Karas Mts. are in the S.E. In the E. is the Kalahari desert.

The climate is warm, and there is a dry season from May to Sept., and a wet one for the rest of the year. Rainfall is scanty on the coast. The mean temp. in summer is 70° F., and in winter 50° F. At Swakopmund fog is recorded 150 days a year. Vegetation varies from the luxuriant palms and other trees of the tropics found in the valleys, to the coarse grasses growing on the desert sand. Among animals are antelopes, monkeys, jackals, hyenas, snakes, and crocodiles.

The chief native industry is keeping cattle, sheep, and goats. Some of the soil is cultivated, the crops including small quantities of wheat, maize, tobacco, and cotton. Fruit, including grapes, and vegetables are grown. The main exports are minerals, mainly tin and vanadium, dairy produce, pelts, guano, and ostrich feathers. The country has a rly. system based on the two ports, Walvis Bay and Lüderitz. From these lines run respectively to Windhoek in the N. and Keetmanshoop in the S., these two places being also linked together. The rlys. are connected with the system of the Cape. There are also well developed motor roads, linking the country with Angola.

The Portuguese were the first Europeans to land in S.W. Africa, but they did not take possession of it. Soon after 1800 some missionaries entered the land. In 1867 Great Britain annexed the islands off the coast, and in 1878 Walvis Bay. In 1883 a German merchant named Lüderitz made the port now named after him into a trading station. Acting unofficially, he had by treaty with a native chief obtained about 200 sq. m. of land there, and in 1884 the district was declared a German protectorate.

FIRST GREAT WAR. On the outbreak of war, Gen. Botha, Gen. Smuts, and the South African government affirmed their loyalty

to the British Empire, and it was indicated to them that the most useful thing they could do at first was to conquer German South-West Africa.

For the first two months of war all went well. Lüderitz Bay (Angra Pequena) was occupied, and a German raiding force was driven back over the Orange river, but until the end of the year progress was hampered by the rebellion in S. Africa (see South Africa).

Early in Dec., 1914, the garrison of Lüderitz Bay was reinforced, and preparations to repair the rly. there were begun. On Christmas Day Col. Skinner began the landing of a division at Walvis Bay. The Germans retired unresisting, and on Jan. 14, 1915, Skinner made a long night march with the Imperial Light Horse and took Swakopmund. Water supply was the great difficulty.

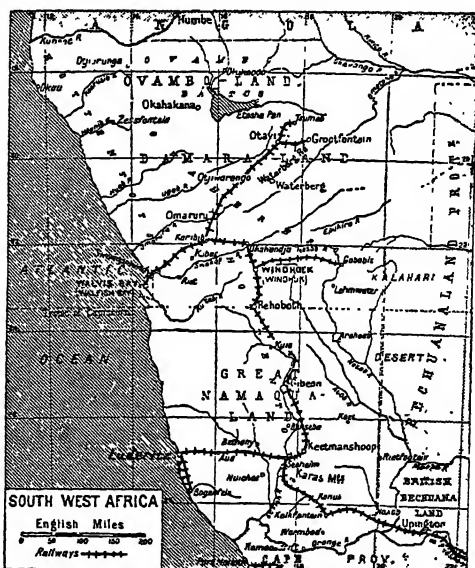
The lines of advance to the capital, Windhoek, had to be determined by rlys., for until the high veld was reached all water supply had to come up from Cape Town. The Germans had constructed rlys. of metre gauge from Orange river, the southern boundary, via Warmbad to Keetmanshoop, where a branch from Lüderitz Bay joined up, northwards to Windhoek, and was then continued in the direction of Swakopmund as far as Karibib; from here there was a light rly. to the coast at Swakopmund. Skinner's first work was to connect this with the base at Walvis Bay, and convert it to metre gauge.

The invasion was arranged in four columns to converge on Windhoek. In all about 50,000 men were employed. The only British regulars were a few officers and a small body of marine artillery lent by the Admiralty to raise and train heavy artillery. The field artillery were mainly British volunteers from the Transvaal and Natal. The mounted troops, of which each column was largely composed, included

the Imperial Light Horse from the Rand. The infantry brigades were mostly volunteer corps, and the young soldiers of the defence force were mainly drawn from the large towns.

Botha, in charge of the northern column, went up to Swakopmund in the early spring of 1915, and from that time events moved rapidly. He pushed rapidly up the bed of the Swakop river, without waiting for the rly. The Swakop was in flood during Feb., and Skinner's first rail from Walvis to Swakopmund running across the bed was swept away by the torrent. It was nevertheless a fortunate happening, as the unexpected water supply rendered possible Botha's sweep up to Karibib and Windhoek, which he entered in May. Meanwhile, the other columns had been making strenuous efforts to cross their respective tracts of desert. When they united, Smuts for a short period took command of the three and rapidly pushed them northward, but Botha's victorious entry into Windhoek soon left him free to carry on his more important work.

The German leader Francke, who had under him about 10,000 men, had evacuated Windhoek a week before Botha's entrance, and had retired along the Otavi rly. to the N. He now asked for an armistice, but on terms impossible to grant, and Botha, after a pause at Karibib to reorganize, followed

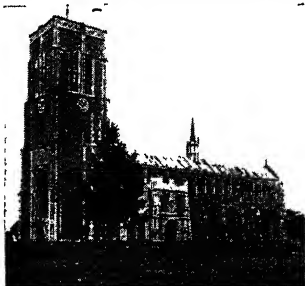


South-West Africa. Map of the territory administered by the Union of South Africa

him N., and after more stupendous treks compelled his unconditional surrender on July 9. See Damara-land; Herero; Lüderitz Bay.

Southwick. Name of several places in England, meaning south settlement. Southwick-on-Wear, Durham co., is virtually an industrial suburb of Sunderland, with shipbuilding yards. Another Southwick is a village on the Sussex coast, 4 m. W. of Brighton. with a rly. station.

Southwold. Mun. bor., seaport, and market town of Suffolk, England. It stands on the E. coast,



Southwold, Suffolk. Parish church of S. Edmund from the south-west

at the mouth of the Blythe, 41 m. N.E. of Ipswich. It is a watering-place and has herring, cod, and sole fisheries. The chief building is the church of S. Edmund, a fine Perpendicular building of the 15th century. There are a harbour and a pier, also an extensive common. An Anglo-Saxon settlement, Southwold became a busy seaport in the 13th century or earlier, having a market and fair. Before the Second Great War the duke of York's camp for boys, founded by King George VI when duke of York, and regularly visited by him, was held here in many summers. In the bay, also called Sole Bay (*q.v.*), English and Dutch ships fought an indecisive action, May 28, 1672. In the First Great War Southwold was bombarded by German vessels, Jan. 27, 1917. Market day, Thurs. Pop. 2,753.

Southwood, JULIUS SALTER ELIAS, VISCOUNT (1873-1946). British newspaper owner. Born in



Lord Southwood, British newspaper owner

Birmingham, June 5, 1873, he had little formal education; he delivered newspapers in London before entering as junior clerk the office of Odhams Bros., printers,

where he worked his way up to chairman and managing director. Odhams Press Ltd. became under Elias one of the biggest British houses issuing periodicals and newspapers. He acquired John Bull, The People, and in 1929 joint ownership (with the T.U.C.) of the Daily Herald. Active in many benevolent causes, he was chairman of the Red Cross penny-a-week fund which raised £17,500,000 during the Second Great War, and of the Great Ormond Street hospital for children. He gave the John Burns collection of books on London to the L.C.C. in 1943. In 1937 he was created a baron, and a viscounty was conferred just before his death, April 10, 1946.

Souza-Botelho, ADELE MARIE EMILIE FILLEUL, MARQUISE DE (1761-1836). French novelist. She was born in Paris, May 14, 1761, and in 1779 married the comte de Flahaut. During the Revolution she fled to England and Germany, her husband being a victim of the guillotine. While in exile she published the first of her novels, the delightful domestic story, *Adèle de Sénange*, 1794. In 1804 she returned to Paris and married the Portuguese minister, the marquis de Souza-Botelho. She died April 16, 1836. Her works were edited by C. A. Sainte-Beuve, 1840.

Sovereign. Coin which, although no longer minted for circulation, remains the standard of the



Sovereign. Reverse and obverse of the British gold coin. Actual diameter $\frac{1}{2}$ in.

British coinage. It consisted of 113,0016 grains of gold and 10,2728 grains of alloy, chiefly copper; and replaced the guinea as the principal coin in 1817. A sovereign weighing 240 grains had been introduced by Henry VII, one of the first English coins on which a serious attempt at portraiture was made. Until called in early in the First Great War, when Treasury notes were issued to replace them, gold coins included sovereigns and half-sovereigns. To celebrate the coronation of King George VI, tokens for £5, £2, £1, and 10s. were issued as collectors' pieces. Banknotes have now entirely replaced gold coins.

Sovereignty. Term used in political science to denote the possession of supreme power, "that absolute despotic power which must in all governments reside somewhere" (Blackstone). The nature of sovereignty has been much discussed throughout the centuries; the question whether it is desirable and practicable to surrender part of the sovereignty of nations to an international body is of current importance.

Hobbes and Austin both recognized that sovereignty might reside in one man or in a number. In any state there must be some final power to decide and to exact obedience; but this becomes a reality only when it cannot be interfered with from outside the state. In Great Britain legal sovereignty rests with the high court of parliament (*i.e.* the king, house of lords, and house of commons), which has "the right to make or unmake any law whatever." Dominion parliaments since the passing of the Statute of Westminster, 1931, have possessed full sovereignty. In the U.S.A. sovereignty is divided by the separation of powers among the president as chief of the executive, congress as the legislature, the supreme court as interpreter of the constitution, and the states through their power to amend it.

Dicey carefully distinguishes legal from political sovereignty; the latter, he holds, rests with the electorate. In any democratic country the position is similar, a test of democracy being the power of changing its government. Even in an autocracy there are limits to sovereignty, *e.g.* the impact of foreign affairs, or the certainty of resistance or disobedience by minorities.

The relationship between the sovereigns or governments of states, the extent to which one of them has the right to limit what the other may do in its own territory, is the province of international law. By every treaty a state surrenders something of its sovereignty. In addition, during the centuries a body of international law, or law of nations, has been evolved, which limits what a sovereign may do within its own territory. The League of Nations, the permanent court of international justice, and U.N.O. presuppose this law of nations. An urgent need today is to devise means by which states can delegate their sovereignty to international agencies in assurance that security and international co-

operation will thus be advanced. The opposition to the proposal for an international atomic energy commission was an emphatic reminder of the importance still attached to sovereignty. See Divine Right; Federalism; King; State. Consult Law of the Constitution, A. V. Dicey, 1885; Problem of Sovereignty, H. J. Laski, 1917.

Soviet (Russian *soviet*, council). Term, meaning originally simply council, which came all over the world to mean the particular kind of councils that until 1936 administered, at all stages, the affairs of the U.S.S.R. The first soviet in this political sense; a committee elected by strikers, met at Ivanovo Voznesensk in 1906, during a general strike. Similar committees were soon set up in Moscow, St. Petersburg, Samara (Kuibishev), Rostov, and other cities. They forced the administration to remedy some of the workers' grievances. Independent of political parties, they were, however, usually convened by members of the Marxist Socialist (Bolshevik) party. When the tsarist regime collapsed in 1917, soviets of the same kind again sprang into being in the factories. At first the Mensheviks and left-wing Revolutionary Socialists had a majority in them; but within a few months the Bolsheviks had secured control of all the principal soviets. The forming of soviets spread to the army and to the villages, and Lenin seized upon them as a suitable means of administration free from all bourgeois associations. Members of local soviets were at first elected by manual and brain workers of 18 and over; district soviets by the local ones, regional soviets by those of the districts, and the All-Russian congress of soviets by those of the regions. This system of indirect election was abolished by the Stalin constitution of 1936, which introduced direct election to the principal administrative body, called the supreme council of the U.S.S.R. Consult Soviet Communism, S. and B. Webb, 1941.

Soviet Central Asia. Area within the U.S.S.R., extending from the Caspian Sea in the W. to the Tien Shan Mts. and the Sinkiang prov. of China in the E., and touching Afghanistan on the S. It embraces five constituent republics of the Soviet Union; Kazakh, to the N., has an area of 1,072,797 sq. m., and is larger than the others combined, which are Kirghiz, Tadzhik, Turkmen, and Uzbek. The area was once generally known as Russian Turkistan.

Each of the republics has its individual entry in this work.

Sovietsky. Name given by the U.S.S.R. to Tilsit, a town formerly in East Prussia, upon its annexation in 1945. See Tilsit.

Sow. Word of A.S. origin for the female of the pig, and by analogy used for the female of the guinea-pig and hedgehog.

Sowerby Bridge. A dist. of Yorkshire (W. R.), in the land. It comprises the former urban dists. of Sowerby Bridge, Sowerby, Luddendenfoot, and Midgley, and the parish of Norland; and is in the co. constituency of Sowerby. On the Calder and Ryburn, 3 m. W. of Halifax, it is a rly. junction. It manufactures woollen, worsted, and cotton goods, and carpets, and has engineering works. Pop. est. 19,515.

Sowing. Farm and garden process for ensuring a new crop by depositing seeds in the soil. The ideal to be aimed at is to get the maximum number of mature plants upon a certain area that will have sufficient space for root development and a proper share of light and air; but the methods practised have to be varied according to the character of the desired crop, size of seed, etc. The surface soil must be brought to a suitable condition of lightness by plough or spade and atmospheric influence.

For field culture the ancient method of sowing broadcast is still followed in places, but mechanical drills are usually preferred. The sower walked the ridges with his "seed-lop" full of seed slung from his shoulder, and taking a handful of the seed cast it evenly in the furrows by a semi-circular sweep of the arm. Although great accuracy is attained by practice in this method, it is necessarily wasteful; and Jethro Tull, the father of modern British husbandry, in the first half of the 18th century invented a drill plough which sowed the seed-corn in parallel lines. From this original corn-drill many highly practical machines have been developed; and by some forms a suitable fertiliser is distributed with the seeds.

In vegetable and flower gardens sowing has to be done by hand, and the chief sowing time is the spring for most hardy annuals and perennials; for certain species, however, the autumn is more favourable. For biennials and tender annuals it is better to sow in May. The ground, well dug in autumn and left rough for the full influence

of frost, is in spring raked to a fine tilth, all stones being removed. Then, by means of a taut line and the hoe, shallow and parallel trenches are traced, their depth and width proportioned to the sizes of the seeds.

The seeds are distributed thinly and evenly along these drills and covered lightly with fine earth. With large hard-coated seeds like those of the pea and bean family, it is advisable to soak them in water for about 12 hours before sowing; and seeds of cannas have the integument so hard that one small spot should be thinned by rubbing on a file, to make it possible for moisture to enter. After sowing, the surface should be sprinkled with water. See Agriculture; Seed.

Sow-Thistle (*Sonchus*). Genus of tender herbs with milky juice, of the family Compositae. Natives



Sow-Thistle. Yellow composite flower-heads and glaucous leaves of the corn sow-thistle

of the temperate regions, they have brittle, hollow stems, and alternate leaves with toothed lobes. The flower-heads are yellow, all the florets strap-shaped. The fruits are flat and ribbed, with numerous silky hairs attached. There are three British species. The corn sow-thistle (*S. arvensis*) is a fine perennial with stout creeping rootstock, stems 2 or 3 ft. high, ending in yellow flower-heads a couple of inches across. The common sow-thistle (*S. oleraceus*) is an annual, and smaller.

Soxhlet Apparatus. Chemical apparatus consisting of a glass flask and condenser used for the automatic extraction of fats or other alcohol-soluble or ether-soluble materials.

Soy (Jap. *shoyu*). Piquant sauce, extensively used in Japan. It is made of soya beans boiled with coarse wheat or barley meal, fermented, and mixed with salt.

Soya Bean OR SOY BEAN (*Glycine soja*). Annual herb of the family Leguminosae, indigenous to tropical Asia. It is one of the

most important oil seed crops of the world, annual production of China and Manchuria being about 12,000,000 tons. In the Far East it has been an important crop from antiquity and is referred to in a Chinese *materia medica* written over 4,500 years ago. Since 1908 it has become a valuable raw material to western civilization, and in the U.S.A. production increased from 800 tons in 1922 to 600,000 in 1942.

The seeds contain about 18 p.c. oil, 40 p.c. albuminoids, and 22 p.c. carbohydrate. The oil, of the semi-drying type, and edible, is used in margarine and in soap. With suitable dryers it can be used in paint and varnishes, replacing about 25 p.c. of the linseed oil, and in the manufacture of alkyl resins for paint, varnish and printing ink. High albuminoid content makes the cake left after expressing the oil an excellent food for milking cows and other cattle. If the oil is completely removed the residue has uses in plastics and adhesives. About 70 p.c. of the plywood made in the U.S.A. is bonded with glues made from soya bean. The moulding industry makes use of soya meal.

In phenol formaldehyde moulding powders, soya can replace about a quarter of the wood filler. The protein reacts with the formaldehyde, thus becoming an active agent and not merely a filler. With formaldehyde alone the soya protein hardens; this property has been utilised in the production of artificial fibres.

The protein is dissolved in alkali and then spun in an acid bath. The thread is stretched and hardened by treatment with formaldehyde. Tensile strength is only 80 p.c. that of wool, but the substance is more resistant to moth and less readily wetted than wool.

The casein from soya bean has the advantage over milk casein in that the supply is not seasonal, is virtually unlimited, and can be used for industrial purposes without encroaching on the world food supply.

Soyer, ALEXIS BENOIT (1809-58). French cook. Born at Meaux, he became famous as a chef in Paris, but fled to England on the outbreak of the Revolution of



Alexis Soyer,
French cook
After Emma Soyer

point him to establish food kitchens in Dublin to relieve the distress. In 1855 he went to the Crimea and, with Florence Nightingale, reorganized the system of the food supply. He died in London, Aug. 8, 1858. He wrote *The Shilling Cookery Book*, 1854.

Spa. Name given to a health resort at which natural waters or baths can be taken for therapeutic purposes. It is derived from Spa (*v.i.*) in Belgium, one of the oldest watering-places. Many forms of natural water exist, suitable for the treatment of various complaints, but the particular character of the water is not the sole factor which gives a spa its therapeutic efficiency.

Hygienic living for a period is often at least as beneficial as the actual taking of the waters. The question of climate has also to be considered, some spas being mild and relatively humid, while others are dry and bracing. A person taking a course of medical baths or waters should place himself under medical advice, and follow a definite system of living, in which due consideration is given to diet, exercises, hours of sleep, and other adjuncts of treatment.

The following are the principal British spas: Bath has been celebrated for the virtue of its waters since Roman times. The thermal waters here range in temperature from 104° to 120° F., and contain calcium and sodium sulphate and magnesium chloride. They are recommended for chronic diseases of the digestive organs, subacute neuritis, sciatica, rheumatoid arthritis, mucous colitis, and skin affections such as eczema and psoriasis. Bath is low-lying, and is most suitable as a health resort from autumn to spring. Bridge of Allan contains a saline spring useful in catarrhal dyspepsia and disorders of the liver. The climate is mild.

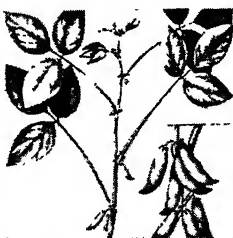
1830. He was head cook at the Reform Club, 1837-50, and the practical interest he showed in the Irish famine of 1847 caused the government to ap-

Buxton stands at an elevation of about 1,000 ft., and its climate is dry and bracing, but cold in winter. The waters have a temperature of 82° F., and are recommended for the treatment of rheumatism, gout, etc. Cheltenham has waters rich in sodium chloride and sulphate, useful in liver and stomach troubles. Droitwich possesses saturated brine baths, which have been found helpful in lumbago, sciatica, and rheumatic affections, neuritis, neuralgia, anaemia, and chronic eczema. Brine baths are also to be found at Nantwich and Northwich.

Harrogate is dry and bracing. The springs consist mainly of two groups: sulphur waters useful in chronic gout, sluggishness of the liver, gastric and intestinal catarrh, and skin diseases, such as gouty eczema and psoriasis; and iron waters useful in anaemia, general debility, and convalescence after severe illness. Leamington is dry and warm. The principal constituent of the waters is sodium chloride. They are mildly aperient, and are useful for dyspepsia and disorders of the liver. Llandrindod has salt waters, some of which also contain sulphuretted hydrogen. These waters have a mild, aperient action, and also stimulate the kidneys. Matlock Bath has waters of a temperature of 70° F. At Strathpeffer are saline springs containing sulphuretted hydrogen. Woodhall Spa, Lincs., has bromo-iodine waters.

In France the chief natural waters are found at Plombières, St. Amand, Mont Doré, Aix-les-Bains, Bourbon l'Archambault, Châtel-Guyon, Vichy, Vals, Royat, Salins-Moutiers, Contrexéville, Martigny-les-Bains, Vittel, and Vernet-les-Bains. In Switzerland there are natural waters at Ragatz-Pfäfers, St. Moritz, Baden, and Weissenburg; in Italy at Salsomaggiore, Abano, and Montecatini; in Germany at Baden-Baden, Wiesbaden, Nauheim, etc., and in Czechoslovakia at Carlsbad and Marienbad. See Baths; Mineral Waters.

Spa. Town of Belgium, in the prov. of Liège. It lies in hilly, wooded, and picturesque country, on the Wayai, 21 m. by rly. S.E. of Liège. At this famous watering-place, the chief of its scattered springs is the Pouhon (Walloon, spring), others being the Géronstère and Prince de Condé springs; the waters (iron and carbon dioxide) are bottled for export. There are attractive promenades, kursal, racecourse, golf course, etc. The picturesque Lac de Warfaz lies 1½ m. N.E. of the town.



Soya Bean. Leaves and buds; inset, pods containing beans



Spa, Belgium. General view of this famous Belgian watering-place

Spa has flourished as a resort since the 16th century, was the most noted in Europe in the 18th century, and was visited by Peter the Great in 1717. Occupied by the Germans in the First Great War from Aug. 4, 1914, it became their G.H.Q. in March, 1918, and the emperor William II lived at the Château du Neubois, near Spa. Here took place the meetings which immediately preceded his flight into Holland, Nov. 8, 1918. Spa was the meeting place of the armistice commission, and in 1920 of the council at which decisions concerning reparations were made. Again occupied by the Germans soon after their invasion in 1940, Spa was liberated by the U.S. 1st army on Sept. 12, 1944.

Spaak, PAUL HENRI (b. 1899). Belgian statesman. Born in Brussels, Jan. 25, 1899, he studied



Paul Spaak,
Belgian statesman

law at its university and became a barrister. Elected Socialist deputy for Brussels in 1932, he became minister of posts and transport in the Van Zeeland government, 1935, and was minister of foreign affairs and trade, 1936-38. Holding that Belgium should remain neutral in the event of war, he conducted negotiations releasing his country from commitments under the Locarno pact and Anglo-French-Belgian agreements. Premier from May, 1938, to Feb., 1939, Spaak again became foreign minister at the outbreak of the Second Great War, and remained so when the Belgian government was exiled in London. He returned to Belgium upon its liberation in 1944, becoming deputy prime

minister under A. van Acker, then his successor for a few weeks, and leading the Belgian delegation to San Francisco. In 1946 he was elected president of the first U.N. general assembly and chairman of the peace conference in London. Premier a third time, 1947-49, he was chosen chairman of the Organisation for European Economic Cooperation (O.E.E.C.), 1948, and president of the assembly of the Council of Europe, 1949.

Spaatz, CARL ANDREW (b. 1891). U.S. army air officer. Born June 23, 1891, he led an air pursuit squadron in France, 1917-18. In the Second Great War he was chief of staff to Gen. Arnold, 1941, and American air commander in Europe, 1942. Spaatz was Allied air commander in the Mediterranean, 1943, commander of U.S. strategic air forces in N.W. Europe, 1944, and was witness to the German surrender at Reims, May 7, 1945, and U.S. representative at the ratification in Berlin, May 8. He was head of the U.S. strategic air force in the Pacific when atomic bombs were dropped on Japan, becoming chief of all U.S. air forces, 1946-48.

Space. One of the fundamental or ultimate concepts. Philosophically it has been explained as continuous extension, or extension as distinct from material substance—phrases which involve the conception itself. Leibniz defined space as the order of possible co-existences. Newton stated that absolute space, in its own nature, without relation to anything external, remains always similar and immovable. Kant conceived space as an *a priori* form of perception. Bergson thought of it as an order, but not the original order of reality, which is time. The theory of relativity (*q.v.*) invalidates the distinction between a three-dimen-

sional space and an independent time, replacing them by a four-dimensional space-time continuum. Many kinds of space are intelligible only to the mathematician and expressible only in mathematical symbols: space of *n*-dimensions, non-Euclidean space, curved space, finite space. *Consult* Time and Free Will, H. Bergson, 1910; *Geometry of Time and Space*, A. A. Robb, 1936.

Spade. One of the black suits in a pack of playing cards; or any card belonging to that suit. Spades began as swords or pikes (Fr. *pique*), and in the Middle Ages doubtless stood for the military class among the four orders of the community. Since then they have acquired a bad reputation. Napoleon I regarded the eight of spades as a card indicating disaster, and the ace of spades has become a symbol of death. This card is usually ornamented in English packs and may bear the maker's name. At bridge, spades were originally the lowest ranking suit, but at auction and contract bridge they are the highest.

Spade Guinea. Popular name for the guinea coined in the reign of George III. It was so called because it bore a spade-shaped shield on its reverse side. *See* Guinea.

Spadix (Gr., a fruiting palm-branch). Form of inflorescence in which many small flowers are clustered round a fleshy spike, often enclosed by a spathe. Examples are afforded by the wake robin (*Arum maculatum*), which has a spathe, and the sweet flag (*Acorus calamus*), which has the spadix naked. It is the form of inflorescence in flamingo-flower (*Anthurium*), palms, calla (*q.v.*), and *Richardia*. *See* Inflorescence; Konjak; Wake-Robin.

Spaghetti (Ital., little ropes). Farinaceous food. It is made of the same paste as macaroni, pressed out into a solid cord-like form thicker than vermicelli. It is cooked with cheese, meat, tomatoes, etc., and is used for puddings and savouries. *See* Macaroni.

Spahi (Persian *sipahi*, soldier, mounted warrior). Name given to men of the Algerian and Tunisian cavalry regiments in the French army. Originating in the Turkish army, the spahis were horsemen furnished by the sultan's feudal lords, and enjoyed a great reputation for valour and loyalty. On their occupation of Algiers and Tunis the French incorporated the Turkish native regiments in their own army, supplying French officers. The word is identical with sepy (*q.v.*). *See* Africa.

SPAIN: ITS HISTORY AND ITS PEOPLES

* ALFONSO LOPEZ, Spanish Writer and Translator

Numerous articles throughout this Encyclopedia describe the cities, towns, and rivers, e.g. Madrid, Seville, and Ebro, of Spain; and there are biographies of kings, e.g. Philip II; men of letters, e.g. Cervantes; and artists, e.g. Murillo. See Spanish-American War; Spanish Succession, War of the; Spanish Civil War. See also Aragon; Castile; Escorial; Granada; Moors, etc.

Spain is a country of S.W. Europe, the larger portion of the Iberian peninsula. Its area is



195,504 sq. m. The Pyrenees divide Spain from France almost completely; only to E. and W., near the coast, is communication easy between the countries. S. of the Pyrenees lies the *meseta* or Spanish plateau.

The chain of the Pyrenees is relatively narrow; barely 170 m. separate the lowland cities of Toulouse and Saragossa; half this distance is across the lowland valleys of the Ebro and the Garonne; less than a third of it lies above 3,000 ft., and the actual width of the range where it rises for 6,000 ft. above the 5,000 ft. level is barely 10 m. Affluents of the Ebro and Garonne take their rise close to the crest line within a few miles of each other at comparatively low levels, and between them rises almost sheer the mountain wall which is characterised by numerous cirques.

Coasts and Land Boundary

The S. coast along the narrows at the W. end of the Mediterranean invites communication. The Sierra Nevada and Rif heights are similar in origin; they present an abrupt slope from the sea. Cadiz and Tangier, Almeria and Melilla, similar in climate and situation, are separated by less than 170 m. of water, while Gibraltar and Ceuta are less than 20 m. apart.

The land boundary with Portugal on the S.W. follows long stretches of the four great rivers Minho, Douro, Tagus, and Guadiana, and crosses the crest lines of the intervening ridges almost at right angles; Portugal essentially comprises the lower valleys of three Spanish rivers, Douro, Tagus, and Guadiana. The N. coast on the Bay of Biscay has few indentations and no great harbours; those of Bilbao, Gijón, and Santander silt up so rapidly as to require continuous dredging. The land rises sharply to the crest of the Cantabrian Mts. and drops steeply to the deep trough of the Bay of Biscay. The N.W. coast on the Atlantic Ocean has ria (q.v.)

indentations, and ports at Ferrol, Corunna, Pontevedra, and Vigo.

The interior of the peninsula consists of the *meseta*, and the fold-mts. of the S.E. These mts., which include the Sierra Nevada and stretch from C. de la Náo to Cadiz, are broken only by the valleys of the Segura and Guadalquivir. The *meseta* is an almost square plateau with an average elevation of about 2,500 ft. It is crossed by a central line of heights parallel with the Tagus, the Sierras de Gata, Gredos, Guadarrama. Almanzor, in Sierra de Gredos, rises to 8,700 ft. It joins the highland which stretches between Burgos and Valencia and presents a scarp face parallel to the Ebro. Lower heights, the Sierra de Toledo, separate the Tagus from the Guadiana. The general tilt of the plateau is towards the W., and across it westward flow the extensive Spanish portions of the valleys of the Douro, Tagus, and Guadiana.

Climate and Vegetation

Spain experiences a curious variety of climate in which the Mediterranean type vies with the continental. The *meseta*, especially in the neighbourhood of Madrid, is the sunniest area in Europe, is the driest area W. of Russia, and suffers very severely from summer drought. Rains, falling almost entirely in the winter, are most frequent in the N.W. corner and on the mts. The clear atmosphere free from rain-clouds permits of fierce heating during the summer days and marked cooling at night, giving to the inland area large daily and annual variations of temp. Though Madrid is so far S., skating is frequently possible in Jan., while shade temp. in July may exceed 100° F. Strong winds are a feature of the plateau, blowing outwards in winter and inwards in summer; in winter these winds partially exclude the rain-bearing ones from the sea, and in summer they are so heated on crossing the plateau as to be rainless. The winter snows and the

spring rains fail to provide sufficient water to keep the rivers filled in the late summer. From Malaga along the Mediterranean coast to Barcelona extensive areas require irrigation; among them are the famous *huertas* of Murcia and Valencia; irrigation is practised near Linares and Saragossa. The slopes of the N. and W. mts. are forested with chestnut, beech, and oak at low levels, birch and mountain ash higher; the S. mts. are clothed with evergreen forest, including cork oaks and Aleppo pine.

The arid *meseta* is treeless and semi-desert heath land—thyme heaths, *tomillares*, or cistus heaths, *jarales*. The plains are steppes; that of Aragon is the *estepa ibérica*. Esparto grass grows in the S.E., wheat chiefly in the Valladolid *campos*. Olives are produced on the three plains and along the Mediterranean coast. Vines are grown in the valleys of the Minho, Douro, Guadalquivir, Segura, and Ebro; they yield sherry, Malaga, and other wines; oranges, lemons, figs, and pomgranates, as well as rice, are the products of the irrigated gardens.

Minerals and Manufactures

Spain is rich in minerals. Coal is mined near Oviedo and N. of Córdova; iron near Bilbao, W. of Córdova, S. of Oviedo, and in the Minho valley; copper at Rio Tinto, mercury at Almaden, lead and silver-lead W. of Malaga.

Spain has comparatively few manufactures. In Catalonia there are textile, chiefly cotton, factories and paper mills. Madrid has iron foundries. Toledo is famous for its sword-blades. Glass and corks are other products. The fisheries yield sardines, tunny, and cod. Sardines are caught off the N.W. coast and near Cadiz and Barcelona; tunny off the S. coast. Fruit, olive oil, and wine form the bulk of the exports; ores, minerals, and timber are sent away in smaller quantities. Machinery, petrol, raw cotton, and tobacco are imported to considerable values, and grain and timber in a lesser degree.

Rly. mileage is less than 11,000 m., of which a quarter is narrow gauge. The E. coast route goes from the French frontier to Barcelona and connects the E. ports with Algeciras; Barcelona and



Spanish flag
red, yellow,
red



Spain. Map of the republic showing the old divisions and the provinces into which the country is divided

Alicante are connected by main line with Madrid. The central route goes S. from the French frontier (San Sebastian) via the junctions of Palencia and Medina to Madrid; the Biscayan and N.W. ports are all connected with Palencia. The four valleys have rly. connexion from Spain into Portugal. The Sierra Morena mining dist. is comparatively well served by main and branch lines. The rivers are useless for navigation, as they usually flow in steep-sided narrow trenches across a rocky floor with rapids. Total road mileage is 80,000 m., of which only 4,500 m. is suitable for fast motor traffic.

The est. pop. (1947) 27,552,484, is sparse, less than 130 to the sq. m. It is densest in the N. Possibly twice as great in Roman times, it has never recovered from the incessant wars of the Middle Ages and the exhaustion that followed colonial expansion in the 16th cent. The rate of increase shows a tendency to accelerate.

The inhabitants of Spain present several very diverse types. The Castilians, inhabiting an arid and unproductive country, bore the brunt of the struggle with the

Moors, and became the dominant group. More reserved and austere than most southern peoples, proud and sensitive, they are the typical Spaniards. The Galician mountaineers are hard-working and backward in civilization. The Andalusians, deeply influenced by Roman and Moorish culture, are soft and pleasure-loving. The Catalans are an active, seafaring, commercial people.

As the result of the Civil War of 1936-39, Spain from April, 1939, was organized as a national state, with supreme authority invested in Gen. Francisco Franco, the principal leader of the nationalists during the Civil War, assisted by a cabinet of 12 ministers. There is an assembly composed of some 500 members, including the ministers, presidents of official institutions and academies, mayors of provincial towns, representatives of professional bodies and of the national syndicates or industrial organizations, and a substantial number of representatives of *Falange Española*, the only political party permitted in the state. This assembly meets at long intervals and its functions are limited to the ratification of government decrees.

The national church is that of Rome. There are nine metropolitan sees, the chief being Toledo, and more than 50 suffragan sees. The religious houses exceed 4,500 in number. Primary education is free, but despite the elaborate educational system promulgated in 1857, but never rigidly enforced, and subsequent efforts under various govts., barely 60 p.c. of the total pop. can read and write. There are 13 universities, including one in the Canary Is., and secondary schools in each prov., but the number of students is small.

Military service is compulsory, nominally for 18 years, of which two years are with the army. The civil guard, or constabulary, and the carabineros, or internal revenue and coastal guards, are recruited from the army and are under military discipline. Including these, the peace establishment numbers well over 500,000. The navy, including marines, numbers about 20,000. Attached to it is a flying service. The air force is small and includes 60 bomber and fighter aircraft.

The Canary and Balearic island groups are administratively within the Spanish state. The Spanish

colonial empire has dwindled to less than 130,000 sq. m., almost all in Africa.

PREHISTORY. The oldest human relic of prehistoric Spain is a skull of Neanderthal type from Gibraltar, although still earlier occupation may be indicated by pre-Mousterian implements. Efforts have been made to account for the Basque language still spoken in the Pyrenees by regarding it as descended from Palaeolithic speech; but the peninsula's outstanding contribution to the story of Palaeolithic Europe comprises several hundreds of mural paintings and engravings in the Aurignacian and Magdalenian caves of N. Spain. At Altamira, Castillo, Pasiega. Hornos, and elsewhere bisons and other animals are depicted with singular realism, although with a ritual purpose. Later came a more conventional style, with domesticated animals and other proofs of Neolithic origin.

Neolithic Spain was occupied by the Iberian branch of the brown Mediterranean family. Later on its mineral wealth attracted the attention of early metal-seekers from the E., and megalithic dolmens and corridor tombs mark the path of advance along the Atlantic coast northward. At Antequera an earthen mound encloses a chamber 80 ft. long, roofed with four massive capstones, the entrance being covered by another of 170 tons. At Alcalar, Los Millares, and elsewhere are tombs whose long stone-lined corridors lead into chambers with beehive roofs and side niches, as at Newgrange (*q.v.*) in Ireland.

The early metal age witnessed the introduction of cultural in-

fluences from the Aegean, and afterwards from Celtic Europe. Local styles of pottery, partly based on textile designs, were followed by one of flamboyant painted ware. Metal work, at first poor in tin, afterwards developed good bronze implements and weapons. The coming of the Phoenicians, in the wake of the Aegean mariners, is indicated by ritual and other remains. (*See* Altamira; Art, Prehistoric.)

HISTORY. It was about 1100 B.C. when the Phoenicians established their first colonies in Spain, and only a little later when the Greeks arrived. Both contented themselves with settlements along the coast, but it was otherwise with the Carthaginians who came across the Mediterranean to help the Phoenicians. They extended their authority over parts of the interior, and trade made the seaports rich and populous.

The contest between Rome and Carthage had a potent influence on the history of Spain, which about 200 B.C. passed into the possession of the Romans, whose name for it was Hispania. It was divided into provs. and governed as was the rest of the empire, receiving, with certain disadvantages inherent in the centralised and bureaucratic rule of Rome, the civilizing benefits that the city conferred upon its possessions. The people were introduced to a great system of law, were familiarised with a high culture in art and literature, and later had Christianity brought into their midst.

The Roman rule, however, was not unchallenged. About 150 B.C. a serious revolt which lasted for 10

years began, and some 70 years later there was another, the followers of Marius finding strong support in Spain. Both were crushed, as was a later rising when Julius Caesar was proprætor. For the next 450 years the history of Spain is that of the Roman empire, of which it was one of the richest and most influential parts.

The fate of Spain in the 5th century was like that of the rest of the empire. Invited by thwarted aspirants to power, the barbarians crossed the frontiers, then almost denuded of defenders, and groups of Alans, Vandals, and others were soon settled on the land. To counter this invasion Rome called upon the Visigoths, and in 414 Ataulph entered the country.

The Visigothic kingdom of Spain, established about 530 by a new effort on the part of that race, lasted for nearly 200 years. It was not a strong one, however, an elective monarchy being one cause of its weakness, and religious dissensions another. The quarrel between the Arians and believers in the orthodox faith was acute. King Recared, at a council of Toledo in 589, declared the Catholic faith to be the national religion, but the Arians were by no means crushed.

The fall of the Visigothic kingdom was due to its internal dissensions. Two rival kings were chosen and one of them looked to Africa for help. At his invitation a band of Muslims arrived in 711 and Roderic, the last Visigothic king, fell in battle. These Muslims were followed by others, and very soon Spain was in Muslim possession. Crushed by Charles Martel when



Spain. Traditional costumes, and a national sport. 1. Valencian women on a gala day. 2. A young couple from the southern provinces. 3. A bull fight in progress

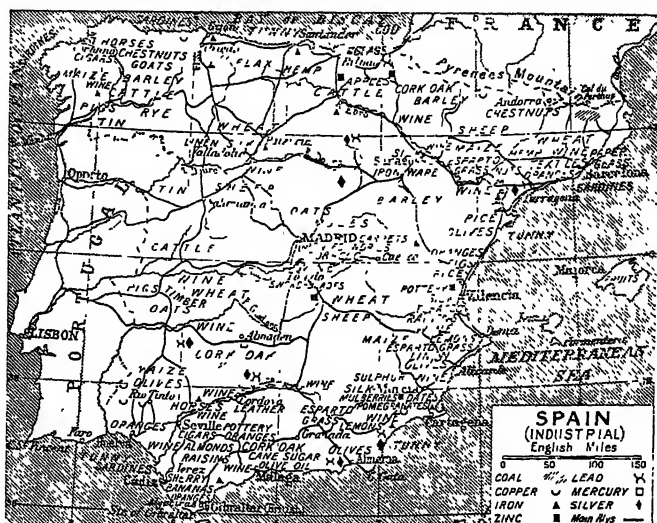
they advanced into France, their hold on Spain remained. Driven from Damascus, one of their princes, Abdur Rahman, came to that country and from that time (758) the Moorish kingdom really dates. With its capital at Cordova, it covered the country as far N. as the Ebro; beyond that river the Christians lived virtually independent in the little states which were taking root and were to emerge as Castile, Leon, Aragon, Navarre, Catalonia, and Galicia.

The Moors, whose rule lasted for about 600 years, had a culture of their own, the influence of which on art and letters has not been confined to Spain. The kingdom suffered much from internal dissensions in the 9th century, but in the 10th a strong central power was established. One caliph reduced his own recalcitrant countrymen to obedience, while another drove back the Christians.

For some time the little Christian states were constantly at war with each other, but soon marriages between their ruling families led to unions of the crowns. In the 12th century Navarre and Castile were united, and later came a union between Castile and Leon. The process continued until, in the 13th century, only Castile and Aragon remained. During this time constitutional experiments in the direction of representative assemblies were made, Leon leading the way in 1020, and the towns secured self-governing privileges. The fight with the Moors continued. The task of the Christians was rendered easier by the fall of the caliphate of Cordova and its replacement by a number of practically independent states. Toledo was taken and made the Castilian capital in 1085.

The forward movement of the Christians was checked in 1086 when Alphonso of Castile was beaten in battle by the Almoravides, who had swarmed over from Africa, but the victories of the latter had one good result. In many parts the Moors and the Christians had begun to live peaceably together, even to intermarry, and this friendly feeling was hastened when the newcomers began to harry those of their own faith, who were less ferocious in their exposition of the Moslem creed. In the 12th century the Almohades superseded the Almoravides.

In the 13th century the Christian power became dominant. The kings of Leon and Castile and of Aragon carried on the war with such success that very soon only Granada was left to the Moors, and that under the suzerainty of Castile. James I of Aragon played



Spain. Map showing the distribution of the principal natural products and industries of the country

a great part in this conquest, and this was the time when Aragon obtained a national parliament and Castile a code of law that influenced European jurisprudence. A civil war in Castile disturbed the progress of the 14th century. Two rivals, Peter the Cruel and Henry, an illegitimate half-brother, were fighting for the crown, and France and England seized the opportunity to carry their struggle into Spain. Henry gained the upper hand, but under his successors the country was for a century in a state of anarchy.

The great period of Spanish history begins with the accession of Isabella to the throne of Castile in 1474. She was married to Ferdinand, who, in 1479, became king of Aragon, this uniting the two remaining Christian kingdoms. Under this firm rule order and prosperity were restored, preparing the way for a fresh campaign against the Moors. In 1492 their last stronghold, Granada, was captured, and in the same year Columbus discovered America. Spaniards crossed the Atlantic to take possession of the new lands, the wealth of which formed an almost inexhaustible treasure house.

In 1516 Spain passed under the rule of Charles, afterwards the emperor Charles V, and thus was incorporated in the Hapsburg dominions. It was separated from Austria on his abdication in 1556, but as left to his son, Philip II, the empire was of immense extent. It included the rich Netherlands, Sicily, and much of Italy; and the southern part of N. America—not only Mexico but also a large part

of what is now the U.S.A. S. America had been divided by the pope between Spain and Portugal, but when Philip was proclaimed king of Portugal in 1580 the whole of that continent became Spanish. Possessions in Africa and in the East complete the tale.

The decay of Spain dates from the time of Philip. He became involved in the war with England which led to the Armada, while the Netherlands broke into revolt and the northern states declared themselves independent. The wealth of America brought about a general disinclination to work, unwise economic laws added to the confusion, and the provinces and the towns lost most of their ancient privileges. The Moriscos were expelled in 1609, while wars drained the country's resources. Spain fought in the Thirty Years' War, continuing the struggle with France until 1659. In 1640 Portugal again became independent.

In 1665 Charles II became king. After an inglorious reign he died in 1700, when the elaborate arrangements made by the rulers of Europe for the partition of his lands were not carried out. Instead, Louis XIV claimed all for his grandson and the War of the Spanish Succession was fought. It ended in the accession of the French prince as Philip V, but Spain's possessions in Italy and the Netherlands were lost.

Under the Bourbon rulers Spain made an attempt to recover her lost glories, and the reign of Charles III (1759-88) was one of reforms at home and abroad. The policy of hostility to France was

abandoned and the two powers were found acting together in almost all the wars of the century. The alliance continued during the early years of the French Revolution, but it was disastrous. Napoleon turned out the Spanish king Ferdinand VII, in favour of his brother José Bonaparte, to which the Spaniards replied by rising in revolt and with the aid of Great Britain carrying on the Peninsular War. The Bourbons were restored in 1814.

Early in the 19th century Spain lost her American colonies, which, during the reign of Ferdinand VII, formed themselves into independent republics. On the king's death in 1833, a civil war broke out between Ferdinand's daughter Isabella and her uncle Don Carlos, the former securing the throne after the first Carlist War. Meanwhile, constitutional privileges had been granted, but unrest continued and for five years (1868-73) the country was in a state of anarchy.

In 1875 Isabella's son, Alphonso XII, was proclaimed king. In 1886, his posthumous son, Alphonso XIII, succeeded. In 1898 Spain and the U.S.A. came to blows, the end being the loss of Cuba and the Philippines. The early years of the 20th century were marked by disorder caused by anarchists and others, events being the riots at Barcelona in 1909 and trouble leading to martial law everywhere in 1911. In 1910-11 there was a quarrel with the Vatican.

The First Great War

Spain remained neutral in the First Great War, despite German efforts to induce her to oppose the Allies. The attacks made by German submarines upon Spanish merchant vessels, 1917-18, often within Spanish territorial waters, led the Spanish govt. to protest.

Meanwhile domestic affairs continued very unsettled, ministry succeeding ministry in bewildering succession. In 1916 there were serious riots and martial law was proclaimed, Barcelona being again the storm centre.

A serious military reverse suffered by the Spanish troops in July, 1921, during a rising in Morocco, caused an acute political crisis, aggravated by growing unrest throughout the country. The insistent demand from press and parliament for an inquiry into the responsibilities for the military disaster brought the army into conflict with the politicians, culminating in a military revolt in Sept., 1923, led by Gen. Primo de

Rivera. Constitutional government was suppressed, and replaced by military rule in the form of a "directorate" with Rivera as prime minister. The dictatorship fell after nearly seven years of inefficient rule, and a cabinet of politicians, charged with the task of preparing the country for a return to constitutional govt., was formed. The first important step was the holding of municipal elections on April 12, 1931, which gave the victory to a coalition of parties opposed to the monarchy. Two days later the king left the country and the republic was proclaimed.

The Spanish Republic

The new régime was disturbed from the beginning by revolts and strikes fostered by extremists from the right and the left. The disestablishment of the Church, the expulsion of the Jesuits, and other anti-clerical measures roused the hostility of the Church and of the moderate elements supporting the republic. A "popular front" govt. was formed in Feb., 1936, as a result of an election in which the Liberals won 162, the Socialists 94, the Communists 16 out of a total of 470 seats. Fascists and monarchists, and their supporters in the armed forces, took that as a challenge, and embarked in a campaign of disruption and insubordination which led to the outbreak of the Civil War five months later. The war lasted nearly three years, ending when the last republican government in Madrid surrendered to the nationalists. During the Second Great War Spain was again neutral, though benevolent towards the Axis. Repeated refusals by the United Nations to admit Spain to membership during Franco's régime had the effect of making the dictator's position stronger rather than weaker.

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LANGUAGE AND LITERATURE.

When speaking of the Spanish language one refers exclusively to the Castilian, which is the official language in Spain and is spoken today by twenty nations. The other languages spoken in Spain are regional in character and use. The chief of these is Catalan, with its variations of Majorcan and Valencian, which has its own literature of no mean merit.

Castilian is derived from popular Latin. The majority of writers maintain that the Goths exercised hardly any influence on its formation, since they can find in it only about 100 Gothic words. The corruption of Latin began during the Roman domination, the language becoming mixed with that then spoken in central Spain by the Celtiberians. The transformation continued during the Visigothic period, and when the Arab invasion took place, those Spaniards who preferred independence and took refuge in the mountains of the N. carried with them a half-formed language, destined to become general. The original Castilian enriched itself considerably from the Arabic during the centuries of the Reconquest.

The Castilian Epics

While the intellectual movement among the Jews and Arabs in the first three centuries of the Reconquest influenced the culture of the Spaniards, Castilian literature began with epic poetry. Religious and warlike poems were composed, celebrating miraculous or heroic deeds, and these were popularised by the travelling bards. Thus the first two works of importance in the middle of the 12th century are a religious drama, *The Mystery of the Magian Kings*, and the epic, *The Poem of the Cid*, which necessarily imply a considerable previous development of the poetic art. The former is noteworthy for the vivacity of its dialogue and dramatic action. *The Poem of the Cid* comprises 3,729 verses; there are gaps in it, but even so it is a most beautiful work which set an ideal for humanity. It is the greatest of Castilian epic poems. Of the 12th and early 13th centuries there are also preserved a number of romances, such as *The Deeds of Don Sancho II of Castile*, and *The Book of Apollonius*.

Gonzalo de Berceo was a poet of great vigour and originality;

although most of his works that have reached us deal with religious subjects, he handles them with novelty and in a simple yet majestic manner. His chief work, the *Life of S. Oria* written towards the end of his life is full of mystic inspiration, revealing both genius and culture. Shortly before the inauguration of didactic prose by Alphonso X, the Poem of Fernán Gonzalez was composed. This work marks the transition from the popular to the artistic epic.

The Great Conquest of Overseas belongs to the 13th century, about the end of the reign of Sancho IV. The king is credited, but not very definitely, with the beginning of the *History of the Knight of God* who was Named Cifar, the precursor in Spain of the books of knight-errantry, in which one can already see the gay and romantic characteristics which were to develop later in Castilian literature.

14th and 15th Century Writings

In the 14th century two figures stand out with great brilliance. The first is Juan Ruiz, whose genius revolutionised ideas, poetry, substance, and methods. The other was the Infante Juan Manuel, grandson of Ferdinand III, who, among other works, mostly didactic, wrote a masterpiece, *The Book of the Deeds of Count Lucanor*. It is written in excellent prose, and there is a summary in verse at the end of each chapter. Other notable works of the 14th century are *The Song of Rodrigo*, attributed to Esteban de Gormaz, which inspired the great work of Corneille and many others based on the doings of the Cid, the *Moral Proverbs of the Jew Sem Tob* (Santos de Carrión), *The Dance of Death*, supposed to be by the same author, and the works of Pedro López de Ayala, the most noteworthy of which are *The Great Chronicle of Spain*, and the poem, *The Palace Rhyme*. Lopez de Ayala was the first to introduce Italian literature to Spain, by translating the works of Guido de Colonna and Boccaccio.

Conspicuous writers of the 15th century were E. de Villena, who composed *The Art of Rhyming* and many other didactic works, among them his *Treatise on Divination* and the *Magic Art*, which earned for him the name of sorcerer and the destruction of his library by order of John II; Juan Alonso de Baena, with his *Song-book of Baena*; the Marquess of Santillana with his famous *Serranillas* and his poems; Juan de Mena with *The Labyrinth of Fortune*; Fernán

Pérez de Guzmán with his *Praises of the Illustrious Men of Spain*, and his *Sea of Histories*; Ruy González de Clavijo with his *History of the Great Tamerlane*; Juan de Dueñas with his *Coplas del Provincial*; Hernando del Pulgar with his *Mingo Revulgo*, a first and intense manifestation of satire; Gomez Manrique with his *Battle of Love* and other celebrated works; and Jorge Manrique with his famous *Coplas*, or verses, on the death of his father, which is a gem of Spanish literature.

For more than 150 years, from 1477, Spanish literature attained its highest perfection. During that time each branch was cultivated separately. The Spanish theatre was initiated with the famous tragi-comedy Calixto and Melibea, commonly known as *La Celestina*, of Fernando de Rojas, and with the works of Juan de la Encina and Lope de Rueda, but it did not acquire its definite form and superb development until Lope de Vega, who may be called the founder, and of his works about 470 are extant. It was continued in that time by Tirso de Molina, Juan Ruiz Alarcón, Calderón, Moreto, and Rojas Zorrilla, to mention the most notable.

Fiction had an initiator in Hurtado de Mendoza with *El Lazarillo del Tormes* (The Beggar of the Tormes) and culminated in Cervantes with *Don Quixote* and his *Exemplary Novels*. This branch was cultivated by Quevedo, Velez de Guevara, Mateo Alemán, and others. Lyric poetry shone with countless good poets, including, besides Lope and Calderón, Gongora and the brothers Argensola, Herrera, Garcilaso, Fray Luis de León, Alcázar, and many others; history with Zurita, Mariana, and Morales; epic poetry with Ercilla's *The Araucana*, celebrating the prowess of the warlike Indians of Chile; and mystic poetry with S. Teresa de Jesús, Fray Luis de Granada, San Juan de la Cruz, and Malón de Chaisde.

Eighteenth-Century Decline

Two other great writers, Saavedra Fajardo and Baltasar Gracián, appear before the end of the 17th century. From this point onwards all the branches of literature seemed to waste away. For the best part of the 18th century only Feijóo, critic and scholar, stands out. After him came Jovellanos and Cadalso, the poet Meléndez Valdés, the fabulists Iriarte and Samaniego. The theatre, which had fallen into decadence, was revived and revolutionised by the plays of Leandro F. de Moratín and Ramón de la Cruz.

At the beginning of the 19th century two great poets appeared, Quintana and Gallego. Then came the romantic period, which in drama was cultivated by Martínez de la Rosa, the duke of Rivas, García Gutiérrez, Hartzenbusch, and José Zorrilla, and in poetry by the last named and by Espronceda, and Arolas. The generation that followed was intermediate between romanticism and realism. It included the dramatists Ventura de la Vega, Bretón de los Herreros, Tamayo y Baus, and Adelardo López de Ayala. At about this time Campoamor began his philosophical, epigrammatic and humorous poems, and Bécquer composed his *Rimas*.

Among the prose writers the most brilliant in the early part of the century was Larra (Figaro). Shortly afterwards came the generation of great novelists, which includes Pedro A. de Alarcón, Pereda, Valera, and Pérez Galdós.

Twentieth-Century Revival

From the beginning of the 20th century there was a revival in all fields of Spanish literature, which, however, came abruptly to an end in 1936, with the outbreak of the Civil War. The outstanding novelists of this period were Pérez Galdós, Valle Inclán, Palacio Valdés, Emilia Pardo Bazán, Blasco Ibáñez, Pío Baroja, and Ramón Pérez de Ayala. The theatre, which for nearly 20 years up to the close of the 19th century had been dominated by the sensational plays of Echegaray, was revolutionised by Jacinto Benavente, who wrote such masterpieces as *Los Intereses Creados* and *La Malquerida*. The stage was also cultivated by the brothers Alvarez Quintero, who produced plays of great vitality and colour, Marquina with historical dramas, Linares Rivas and Martínez Sierra with high comedy, and Perez Galdós with great plays such as *La Loca de la Casa* and *Mariucha*. Light comedy had its masters in Ricardo de la Vega and Javier de Burgos. Lyric poetry was revived by Rubén Darío, Villaspesa, the brothers Machado, and others. Among the poets of modern tendencies the outstanding figures were García Lorca, Pedro Salinas, and Rafael Alberti.

Among the essayists and philosophical writers, Unamuno and Ortega y Gasset are the most prominent. In the domains of erudition and literary criticism the greatest figure of the period was Menéndez Pelayo. His work was successfully continued by Menéndez

dez Pidal and J. Martínez Ruiz (Azorin).

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ART. There are three characteristics of Spanish painting. The subjects are almost always devotional; the colour schemes invariably have a somewhat sombre hue; the school, compared with that of other countries, is late. It did not attain high importance until the latter part of the 16th century. Furthermore, the Spanish painters were in many instances craftsmen, and designed fine work in gold or wrought iron, in carved wood, in stone, and even in architecture, as well as in painting.

The earliest days of Spanish graphic art were influenced by Jan Van Eyck, who visited Spain in 1428, and impressed his characteristics upon the artists of the day. Gothic art in Spain was much connected with mural decoration. There were various schools, having little connexion with one another, existing in different divisions of the country, Castile, Andalusia, Valencia, etc. Notable men of this period were Alexo Fernandez (fl. 1506-25), Rincón (fl. c. 1500), Borgoña (d. 1533), noted also for his sculpture in wood and stone, and Pedro Berruguete (d. c. 1503). In the early 16th century Italian influence can be discerned, and Alonso Berruguete (1480-1561), the son of Pedro, was one of its most notable exponents. His work can be studied specially at Valladolid. Other artists of this period were Luis de Morales (1509-86), the painter of altar-pieces under Philip II, Velasco of Toledo (fl. 1580), and Luis de Vargas, a painter of Seville (1502-68). A little later Venetian influence became paramount, and the representative artist was Juan Fernandez Navarrete (c. 1526-79), the dumb painter known as El Mudo.

The great period starts with the Cretan, Domenico Theotocopuli, generally known as El Greco. The supreme painter of Spain was Velazquez, an artist of incomparable skill, the triumphant painter of life and character. Murillo was the leading painter for the Church, painting in monastic houses and

ecclesiastical establishments, and producing many altar-pieces. These pictures are rich in quality, deep in shade or strong in light, and glow with brilliant colour, but his greatest works were his genre pictures, frank expressions of the life of the people.

Zurbarán, the peasant painter, represents the asceticism of Spain, and what might be termed its indifference to actual beauty. No one ever painted monks as he did. He ignored idealism and had a passion for the actual and real. Quite different was Ribera. He was a fine draughtsman, a dramatic painter, full of Italian feeling, dexterous in the management of colour, and revelling in intense shadows, always having before him a decorative ideal.

Francisco de Goya, the satirist and portrait painter, differing from all who had preceded him, scoffed at ecclesiastical life, and was bitter in his satire respecting it and court ceremonial, able, however, to paint court groups with extreme skill, to produce wonderful portraits, audacious perhaps in draughtsmanship, but magical in effect of colour. He was a great decorator, and his balcony scenes in the church of San Antonio de la Florida, irreverent though they may be, are marvellous works.

Later Painters

Of the modern school, Mariano Fortuny came from Barcelona. He was a painter of beauty, strongly attracted by objects of colour, rare textures, Arab mosaics, weapons, and tapestry. Few could paint with such skill a wedding group, the interior of a sacristy, the vestments of a priest, the gorgeous colour of a room, the imposing ceremonial of a court.

Sorolla y Bastida (d. 1923) was a great painter of sunlight, of the sea, of vivid movement; his work was characterised by brilliant execution and glowing colour. Ignacio Zuloaga (d. 1946) was a realist, who dipped his brush in blazing colours and, regardless of the ordinary canons of beauty, determined to present truth in all its stern austerity.

The medieval sculpture of Spain was strongly influenced by that of the French, of whom the native artists were apt pupils, as shown by the figures on the W. front of the cathedral of Santiago de Compostela, designed about 1188 by Master Mateo, by the 13th century statuary in Tarragona cathedral, and that of the 14th century at Gerona. In the 15th century German, and in the 16th Italian influence appear. The great Spanish

sculptors of the Renaissance were Alonso Berruguete and Gaspar Becerra (1520-70).

The most characteristic form of sculpture is the wood-carving of the 16th and 17th centuries, which is the glory of many Spanish churches, especially the retables and religious figures called *pasos*. P. de Vigarni, J. M. Montañés (d. 1649), and Alonso Cano (1600-67) were notable masters of this art. Later statuary, partly through the discouragement of the study of the nude, decayed. S. Churriguera (1650-1725) founded a tasteless baroque style, overloaded with ornament. Late in the 19th century a revival began in Catalonia.

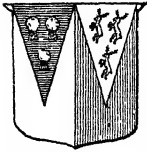
Spanish architecture was moulded by two powerful influences, the Moorish and the French. Gothic developed late, and shows little independence, although before the middle of the 13th century three magnificent cathedrals were built, Burgos, Leon, and above all Toledo. The flamboyant style developed early in the 16th century into the national plateresque, or silversmiths' style, which combines the rich conventional decoration derived from the Moors with Renaissance features. Ornament is often concentrated on the portals. Later Renaissance work developed on national lines, the heavy Italian cornice being replaced by the open gallery at the top of the wall.

The minor arts were brought to a high standard in the great age of Spain. The production of lustrous ware and of coloured and stamped tiles was learnt from the Moors, but perhaps the finest work was done in metal. The churches of few if any countries have such exquisite goldsmiths' and silversmiths' work, jewelry set in silver filigree, tabernacles, silver-plated iron screens, candelabra, and monstrances. Some of the best work was done by the families of Arfe, of Flemish origin (15th and 16th centuries), at Córdoba and Seville, and of Becerril (16th century) at Cuenca.

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Spalato. This seaport on the Dalmatian coast of Yugoslavia is generally known as Split (*q.v.*)

Spalding. Market town and urban dist. in the Holland div. of Lincs, England. It stands on the Welland, 14m. S.S.W. of Boston, and is a rly. junction. The principal building is the parish church of SS. Mary and Nicholas, a 13th century building restored in the



Spalding arms

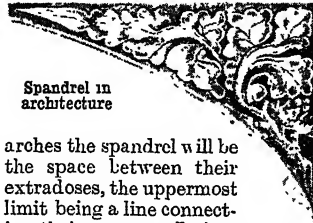
19th century. It has four aisles and a notable lady chapel. Other buildings include the corn exchange and the Johnson hospital. There is a grammar school, founded in 1567, but occupying a modern building, and remains of a priory. Ayscoughfee Hall, dating from 1420, was the residence of Maurice Johnson. An agricultural and horticultural centre, Spalding has a trade along the river. Other industries are breweries, flour mills, and sawmills, while tractors and agricultural implements are made. Around the town is reclaimed fenland on which bulbs are grown. In Spalding in 1710 Maurice Johnson founded the Gentlemen's Society, a club of which Addison, Newton, and Pope were members; it still exists. The Romans built a bridge here, but the place grew up around a priory and until the Reformation was under the authority of the prior. Market day, Tues. Pop. 13,500.

Span. Linear measure, half a cubit. One of the natural measures, it was the stretch of the fully opened hand from little finger to thumb (9 or 10 ins.).

Spandau. Borough of Berlin, Germany, situated about the junction of the Havel and the Spree, 8 m. W. of the city centre. Before the First Great War it was a garrison town, having also an arsenal and factories for the manufacture of arms and ammunition. Some of these were later converted into plants making machines and motor vehicles. The chief building was the 16th century citadel, and the Julius tower therein was selected to hold £6,000,000 of gold exacted from France in 1871. Here also was the German academy of gymnastics. Spandau was made a municipality in 1232.

and later the electors of Brandenburg had a residence here. It was taken by the Swedes in 1635 and by the French in 1806. There was heavy bombing in the Second Great War, after which it lay in the British-occupied sector of Berlin. Pop. approx. 100,000.

Spandrel. In architecture, the space between the extrados or outer curve of an arch, a horizontal line from the crown of the arch, and a vertical line from its springing. Where there are two adjoining



Spandrel in architecture

arches the spandrel will be the space between their extradoses, the uppermost limit being a line connecting their crowns. It is a favourite place for sculptural and other decoration. See Arch.

Spaniards Inn, THE. Tavern at the junction of Spaniards Road and Hampstead Lane, Hampstead Heath, London, N.W. The Gordon rioters were delayed here while on their way to destroy Lord Mansfield's house at Ken Wood, 1780. The inn dates from the 18th century. Spaniards Road, overlooking the Heath, is a popular promenade. See Ken Wood.

Spaniel (old Fr. *espagneul*, Spanish). Group of dogs, distinguished by a wide short skull, a high forehead, a heavy build, and large pendent ears. Most have thick, long, and silky hair. The three main classes are land, water, and toy spaniels. In the wider sense of the word, spaniels include setters, retrievers, Newfoundlands, St. Bernards, and probably poodles. Of the other breeds, the Clumber spaniel takes its name from a seat of the duke of Newcastle, who introduced it to Great Britain from France. It is a large, heavy animal,

with a dense coat of white and lemon-coloured hair, and makes a good dog with guns.

The cocker spaniel is only half the size, with a longer head, and silky wavy hair. It derives its name from its use in woodcock shooting, and will drive game from low coverts and hedges. The field spaniel is a long-bodied, short-legged type, formerly black in colour, but now varied. It is a favourite show dog, and the practice of breeding for points has tended to diminish its usefulness. It is an active and lively dog, and works well with guns. The water spaniel is an Irish breed, now seldom found pure. It is a large dog with splay feet and a curly coat of rather oily hair, and has a top-knot on the head, but the face is usually rather bare. It is used for retrieving game from water, and is a strong and ready swimmer.

The various toy spaniels are kept purely as pets. One of the most famous is the King Charles

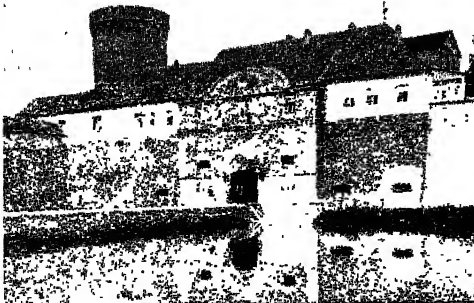


Spaniel. An English springer, a variety of this sporting breed

(q.v.). The Blenheim spaniel is somewhat similar, but its colour is white and tan with a blaze of white on the head. It should have a round head with upturned nose and a very short muzzle, and the ears should touch the ground. The Prince Charles and the ruby spaniel differ only in colour, the former being black, white, and tan, and the latter a rich red.

Pekinese dogs were imported from China late in the 19th century, and are much in demand as pets. They often weigh less than four pounds, and have very short muzzles and long hair. The tail is carried curled over the right side of the back, and a reddish fawn is the favourite colour. See Dogs colour plate.

Spanish-American War. Conflict between the U.S.A. and Spain, 1898. The proximity of Cuba to the U.S.A. had caused that power



Spandau, Germany. The Julius Tower, in which was deposited the gold exacted from France in 1871

to view with misgiving the misgovernment of Spain. Matters came to a crisis after the rising of 1895, the crushing of which reduced Cuba to starvation and ruin. Friendly suggestions from the U.S.A. passed unnoticed, the rights of American citizens were ignored, and in 1897 the U.S.A. began to make serious preparations for intervention. On Feb. 15, 1898, the U.S. battleship Maine was blown up in Havana Harbour, according to investigators by a mine, and on March 11 the U.S. army mobilised. Congress declared the independence of Cuba, April 11, and Spain declared war April 24.

The naval campaign was localised to the Philippine Islands and Cuba. In the former Admiral Dewey destroyed the Spanish fleet under Admiral Montojo at the battle of Manila Bay (q.v.), May 1; while off Cuba Cervera's fleet was

blockaded in Santiago Bay by Admiral Sampson until July 3, when the Spaniards slipped out, were chased, and totally defeated. In the meantime, military operations had begun in Cuba with the landing of 16,000 men of the U.S. army. Aided by the Cubans, the Americans attacked Santiago, which capitulated July 16. Eleven days later the Americans landed at Puerto Rico, and the end of the war came with a combined naval and military attack on Manila, Aug. 13, the Spanish forces, some 13,000, capitulating next day. Peace was concluded in Paris, Dec. 10. Spain relinquished Cuba and in return for £4,000,000 ceded the Philippines, Puerto Rico, and Guam to the U.S.A. See Cuba; Philippine Islands; Spain; United States (History). Consult History of the Spanish-American War, R. Titherington, 1900.

result despite the slight preponderance of right plus centre votes over left votes as a mandate for social revolution, the right parties embarked upon a series of acts of provocation in order to embarrass the new govt. The spring and early summer of 1936 was a period of violence, strikes, lock-outs, and street-fights. The former ruling class began preparations for a full-scale revolt. The great landowners, the aristocracy, the industrialists, the financiers, the higher army officers, and the Church all saw their vital interests threatened by the general unrest, and determined to defend them by any means. Propaganda campaigns by both sides became intense.

The spark which set light to the powder-magazine was the murder by right supporters of Lt. Castillo on the night of July 12-13, and the reprisal murder of the right leader Calvo Sotelo next day. Calvo Sotelo, it was afterwards disclosed, was political leader-designate of the movement to overthrow the govt. by force. The military leader was Gen. Mola, commanding in Navarro and Burgos, who had ordered his fellow-conspirators in the army to be ready and at their posts on July 15. They were Queipo de Llano in Andalusia, Cabanellas in Saragossa, Saliquet in Valladolid, González Carrasco in Valencia, Goded in Catalonia, Fanjul in Madrid, and Franco in Spanish Morocco. A message from Mola informed the Falangist leader José Antonio Primo de Rivera that he had fixed the rising for July 18, 19, and 20. Gen. Franco publicly announced the insurrection on July 17-18.

SPANISH CIVIL WAR, 1936-1939

Charles Duff, Editor, *The War in Spain*

This account of the worst civil war in modern Spain begins with the results of the Feb., 1936, election and concludes with the establishment in power of the Franco regime. See also Franco, F.; Mola, E.; Primo de Rivera; Spain: History

The Spanish Civil War began with a military insurrection in Spanish Morocco on July 17, 1936, in metropolitan Spain on July 18. The permanent unrest in Spain arises from the fact that the Spanish people have not progressed beyond the first phase of democratic evolution. The end of the monarchy, with Alfonso XIII's departure from Spain and the proclamation of the second republic (April 14, 1931), marked a step towards social revolution. Parl. elections held on Feb. 16, 1936, resulted in

the return of 265 members of "left" sympathy (of whom 238 belonged to the "popular front" parties—136 left Republicans, 87 Socialists, 15 Communists), who polled 4,523,981 votes; 142 members of "right" sympathy, including Basque Nationalists, polling 4,128,092 votes; 66 members of "centre" sympathy, polling 449,320 votes. Not one representative of the Falange (extreme right) party was elected. The popular front parties, who took office, interpreting the election



Spanish Civil War. Spanish government troops crossing the river Ebro with the aid of a pontoon bridge in an advance against General Franco's Nationalist forces, July, 1938



Spanish Civil War. Pictures showing the plight of civilians, chief victims of civil war. 1. Refugees fleeing from their homes in the centre of Teruel. 2. Boats bringing refugees to the French bank of the Bidassoa, whence they watch the burning of their homes in Irun. 3. Last militiamen of Catalonia arriving in France by the passes over the Pyrenees. On the road they pass a blackboard ironically inviting those who wish to join Franco

On the 18th all the other generals, and Admiral Salas in command of the fleet, set their forces in action. The insurgents (who called their rebellion a great national movement) hoped that, because of their command of all national forces plus the element of surprise and, not least, because of the governmental confusion and the lack of unity among its supporters, that their movement would quickly succeed. Mola had assured himself of support by the majority of army officers, of the fleet, the civil guards, two Moroccan divs., the Foreign Legion, the Falangists, and the fanatical *Requetés* or Carlist-Monarchists. He had, furthermore, assurances of help from the dictators of Germany, Italy, and Portugal; and he relied upon the moral support of the Church. But to the surprise of the insurgents there was an immediate and spontaneous rising of the Spanish people in defence of the govt. In the first days and weeks of the struggle, they fought trained and well-equipped troops with any sort of weapons, and with astonishing

success, sacrificing themselves with great courage against apparently impossible odds. The generals' revolt had brought a measure of unity and collaboration to the govt. and its supporters. So great and effective was this counter-movement that the carefully planned military rebellion was defeated outright in the Basque provs., in the whole of Catalonia with its important capital Barcelona, in all the Mediterranean provs. round to Málaga, in Asturias, in Madrid and the centre of Spain, and in the island of Minorca with its important naval base Port Mahon. The rebellion succeeded in Morocco, in Majorca, in western Spain from Galicia to near Málaga, including Seville and Cadiz; and in the Canary Is. Spain was now divided into two as yet not sharply divided zones.

Having succeeded in Morocco, Franco moved to the mainland, bringing with him his Moorish troops and the *Tercio* or Foreign Legion Mola, meanwhile, pressing forward towards the capital with four columns, made the famous

remark that in Madrid he had a "fifth column" of supporters. These were the two outstanding generals on the rebel side. The death of Mola in an air crash on June 3, 1937, left Franco in undisputed command of the national movement. The war had everywhere been fought and continued to be fought with great ferocity on both sides.

On July 28, four Italian Caproni warplanes with Italian air force crews landed inadvertently in French Morocco. Interviewed by Marcel Peyrouton, the French high commissioner, they declared that they had received instructions on July 15 to report to the Nationalists in Spanish Morocco. Italian and German help to the Nationalists increased, and Great Britain, seeing in this active intervention a threat to European peace, on Aug. 4 suggested to France the negotiation of a non-intervention agreement in which the U.K., Germany, France, Italy, and Portugal should participate. On Aug. 25 the U.S.S.R. announced its adherence to the agreement reached on Aug. 15 by the U.K. and France. Although both Germany and Italy agreed to it, they did not observe it, with the result that the U.S.S.R. considered itself free to send arms to the Spanish govt. of Largo Caballero. These arms began to arrive in Spain towards the end of Oct., 1936. Thus, what had begun as a military revolt and developed into a civil war, now took on the complexion of a civil war plus an ideological struggle with international complications. Spain became a cock-pit in which one side had the active support of Nazi Germany and Fascist Italy, and the other received help from the U.S.S.R., from Mexico, and also in the form of international brigades recruited from nationals of many countries which entered

the struggle at Madrid in Nov. when the defenders were severely pressed. The international brigades never reached a total of 50,000 men and were disbanded in Oct., 1938, by the govt. of Dr. Negrín—a gesture of good faith which the Spanish premier hoped would persuade France and the U.K. to press for the withdrawal of the considerable German and Italian forces, which, despite denials by their govts., were fighting on the side of the Nationalists.

Three Phases of the Conflict

The opening phase in the war, from July to Sept., 1936, was a military rebellion countered by a mass rising. It was followed from Oct., 1936, to Nov., 1938, by a period of irregular or quasi-guerrilla fighting changing to full-scale regular warfare in which forces of almost 1,000,000 men on each side became locked on a front of about 1,000 miles in a life and death struggle. Outstanding military incidents were the successful defence by the rebels of the Alcázar fortress at Toledo (July 18–Sept. 27, 1936); the taking of Málaga (Feb. 8, 1937) by a mixed force of rebels and Italian troops; the campaign (May–June, 1937) resulting in the capture of the Basque provs. by a Nationalist force, largely Italian and assisted by the German Condor legion (air force with Franco); the total destruction by high explosive and incendiary bombs of Guernica, the historical little Basque capital (April 26, 1937) by Condor aircraft under the command of the German Gen. Sperle (who afterwards directed Luftwaffe attacks on London and other English cities); the defeat and rout of Italian forces at Guadalajara (March 12, 1937) by a govt. force commanded by Gen. Miaja; the capture of Teruel (Jan. 17, 1938) by govt. forces, and its abandonment by them (Feb. 22, 1938) after one of the most cruel struggles of the war; the brilliant crossing of the River Ebro (July 25, 1938) by govt. forces; the Nationalist drive to the Mediterranean, reached by Franco's forces at Vinaroz on April 15, 1938, a move which cut off Catalonia from the rest of government Spain. Four days later Franco broadcast from Saragossa: "The war is now over. These are the days of conquest." The war was to last almost another year, for the govt. continued to defend Madrid successfully.

During the second phase of the war, Spain became sharply divided into two zones, Nationalist and Loyalist. The Nationalist zone,

being the better for wheat-production and having behind it the Portuguese supply base, did not suffer from lack of food, and the govt. on the whole refrained from bombing its civilian populations. By the winter of 1938, and until the end, the Loyalist zone was reduced to a state of semi-starvation by the Nationalist blockade. Its civil population was harassed by unrestrained and for the most part indiscriminate bombing by German and Italian aircraft.

Phase 3 of this fratricidal strife was from Nov., 1938, until the end, a period during which Franco's forces, in many places victorious and now well equipped, gave proof that he had reason when he said to a newspaper correspondent: "We shall win because we have most material."

The Nationalists Victorious

Barcelona fell to the Nationalists on Jan. 26, 1939, and Franco's men advanced rapidly northwards through Catalonia, driving before them the remainder of the govt.'s forces in that area, severely handicapped in fighting the rearguard battle by nearly half a million civilian fugitives who cluttered the roads until they reached the French frontier and crossed into France. The war in Catalonia ended on Feb. 9, 1939, the Nationalist offensive which achieved the conquest of this area being almost entirely an Italian military operation.

In Madrid the defence still held. Thither Negrín flew on the fall of Catalonia, his object being to reorganize the govt.'s forces in the central zone and continue resistance until the arrival of a substantial supply of expected arms. The morale of the Madrileños and of the population in the central zone remained unshaken by their own sufferings or by the military defeats on other fronts. Experts, including many foreign observers, were of opinion that the capital would still be able to hold out for several months.

When Negrín arrived in Madrid, however, on Feb. 10, 1939, he found that two groups, one influenced by the elderly Socialist Don Julian Besteiro, the other by Col. Sigismundo Casado (commanding the Madrid army), had joined forces with the object of negotiating peace with Franco. Casado's view was that Franco would not negotiate with the Socialist leader Negrín, and he assured British officials in Madrid that, as a soldier, he could get much more out of Franco: a military dictatorship excluding all Communist influence,

he thought, would be the best to negotiate peace. While Casado was winning support for this idea, Negrín, apostle of continued resistance, announced that he would broadcast an appeal to the nation on March 5. Casado and Besteiro and their supporters (calling themselves a council of national defence) forthwith issued a manifesto opposing the policy of continued resistance, and the two leaders made speeches, Casado's directed to "the Spaniards on the other side of the trenches" appealing for an "honourable peace without reprisals." The effect of the manifesto and speeches was to split the govt. forces, and cause dismay and despondency in the central zone, as a corollary of which the govt. fleet left Cartagena on March 4 for N. Africa—an act of desertion. A series of deeply tragic incidents followed. Men who had since July, 1936, fought beside each other in the defence of the capital now fought with one another, those favouring resistance against those who wished the war to end.

Franco disillusioned the party who believed in the theory that he would negotiate with a soldier but not with Negrín. The Nationalist leader announced categorically that his terms were unconditional surrender. By this time the morale of the people and of the troops, and with it the military position of Madrid, were so weakened that further resistance to the overwhelming Nationalist armies was useless, and Madrid surrendered on March 28, 1939.

The Aftermath

Fighting had everywhere ceased, and the weary and hungry soldiers of the govt.'s army were in many places already filling the roads on the way to their homes. So ended the most bitter and devastating civil war Spain had ever known.

Madrid was occupied by Franco's forces on March 30. Nationalist military tribunals were set up and in the months which followed thousands who had supported the government cause were tried for "rebellion," and sentenced to death or given long terms of imprisonment. How many suffered in this way cannot be computed, but in the summer of 1948 it was estimated that there were still approx. 100,000 political prisoners in the jails, and military tribunals were still functioning. In the year 1947 the number executed for activities against the regime was officially stated to be 252.

The first result of the civil war was the consolidation of the total-

tarian regime which Franco had established in the Nationalist zone. He himself became *El Caudillo*, the leader, a term equivalent to *Der Führer* of Germany and *Il Duce* of Italy. The new Spanish regime was an adaptation of Italian Fascism and German National Socialism, based on the 26 points of the programme of the Falange, or Spanish Fascist party, which, from small beginnings had grown under Franco's leadership to number, it was claimed in 1942, some three million members.

Bibliography. For the Nationalist point of view and account of the Spanish Civil War see *The Spanish Arena*, W. Foss and C. Gerahty, 1938; for the military campaigns see *Preparación y Desarrollo del Alzamiento Nacional*, Felipe Bertrán Guell (Nationalist account); see *The Civil War in Spain*, F. Jellinek, 1938, for an account from the Government point of view; *Foreign Intervention in Spain*, "Hispanicus," 1938, documents German and Italian intervention. The following should be consulted: *Survey of International Affairs* (especially vol. 2, 1939), ed. Arnold J. Toynbee; *Freedom's Battle*, A. del Vayo, 1940; *The Tree of Gernika*, G. L. Steer, 1938; *Homage to Catalonia*, G. Orwell, 1938; *Life and Death of the Spanish Republic*, H. Buckley, 1940.

Spanish Fly (*Lytta vesicatoria*). Really a green beetle, from which the pharmaceutical product cantharidin is prepared. See *Blister Beetle*; *Cantharides*.

Spanish Main. Name formerly given to the Spanish possessions on the coast of the American mainland from the mouth of the Orinoco to Yucatan, and often loosely used as a synonym for the neighbouring Caribbean Sea.

Spanish Reformed Church. Protestant Church in Spain. It arose in Seville in 1871, spread to other parts of Spain and to Portugal, and applied to the Church of England in 1878 for the consecration of a bishop. Plunket, archbishop of Dublin, and two bishops then consecrated the former R.C. priest, J. Cabrera. The Spanish Reformed Church used a liturgy composed of materials taken from the Anglican Prayer Book and the ancient Mozarabic liturgy.

Spanish Succession. WAR OF THE. European war, fought 1702-14, by France, Spain, and Bavaria, against Austria, Prussia, Great Britain, Holland, Denmark, and Portugal. Savoy fought first for France and from 1703 for the coalition.

By the partition treaties of 1698 and 1700 Louis XIV had renounced all claims of his family to the throne

of Spain. When Charles II of Spain died, Nov. 1, 1700, Louis ignored his obligations and claimed the throne for his grandson, Philip of Anjou, while the emperor Leopold claimed it for his son, the archduke Charles. The French occupied the fortresses in the Spanish Netherlands in Feb., 1701, and were attacked by the Austrians in N. Italy. William III, foreseeing the conflict, formed a league called the Grand Alliance (*q.v.*), which, having completed its preparations, declared war, May 4, 1702. Marlborough, in command of an army of British and Dutch, advanced into the Spanish Netherlands; a German army crossed the Rhine, and was subsequently defeated at Friedlingen; and the campaign was carried into Italy by Prince Eugene.

In conjunction with the elector of Bavaria, Louis aimed a blow at Vienna, to counter which Marlborough made a remarkable march to the Danube, joined forces with Eugene and defeated the French at Blenheim (*q.v.*), Aug. 2 (O.S.), 1704. The French withdrew across the Rhine, followed by Marlborough, who carried the war into the Moselle valley. In 1705 he returned to Flanders and gained the whole country by his victory at Ramillies (*q.v.*), May 23, 1706. Meanwhile, Eugene had beaten the French in Italy, Great Britain had captured Gibraltar, 1704, and fortune seemed against France. The campaigns of 1707 were more or less failures, and early in 1708 the French seized Ghent and Bruges.

But Marlborough gained another victory at Oudenarde (*q.v.*), July 11, 1708, recaptured the lost cities, and took Lille. Louis then asked for peace, but the Allied terms were too onerous. Tournai was taken, the French Marshal Villars was defeated at Malplaquet (*q.v.*), Sept. 11, 1709, and Mons fell to the British. But Marlborough was recalled and dismissed by the Tories in 1710, and the war dragged on until an armistice between Great Britain and France was signed in June, 1712. Holland, Prussia, and Savoy continued the war until the peace of Utrecht (*q.v.*), April 11, 1713, and the new emperor Charles VI fought on for another year, concluding a peace at Rastatt, ratified in the treaty of Baden (*q.v.*), Sept. 7, 1714.

After the fall of Gibraltar in 1704 the British and Dutch, cooperating with the Archduke Charles, took Barcelona, Oct. 9, 1705, while another force, under Galway, entered Madrid in 1706. But the success was short lived. Madrid was

taken by the French commander, the duke of Berwick, who defeated Galway on the plain of Almanza (*q.v.*), April 25, 1707.

The result of this war was that the Bourbon candidate Philip of Anjou retained the throne, on the condition that no one person should ever wear the crowns of both France and Spain. Austria obtained the Spanish Netherlands, the duchy of Milan, Naples, and Sardinia, which last was later exchanged for Sicily, originally awarded to Savoy. Great Britain secured Newfoundland, Nova Scotia, Hudson Bay, Gibraltar, and Minorca, and important trading rights. Consult *History of the War of Succession in Spain*, Lord Mahon, 2nd ed. 1836; *The War of Succession in Spain*, A. Parnell, 1888.

Spanish Town. A town of Jamaica. It is a rly. junction on the Cobre river, 15 m. by rly. W.N.W. of Kingston. Founded by Diego Columbus in 1525, and originally called Santiago de la Vega, it was the capital of the island until 1871. Pop. 12,007.

Spanner. Implement for turning a nut on a bolt or a screw. It consists of a steel lever, or tube, or separate socket, shaped to conform with the outside of the nut. The lever type may have jaws at one end only, or at both ends so as to serve for two sizes of nut. These are "set" spanners, *i.e.* adapted for a fixed size. In adjustable spanners a loose jaw actuated usually by a screw can be brought up to a fixed jaw so as to accommodate variously sized nuts within its limits of movement. The adjustable spanner has more the nature of a wrench (*q.v.*).

When there is not room to permit the swing of a lever spanner, a tubular type or one of the socket spanners is used. The tubular spanner is either single- or double-ended, the end(s) being shaped to fit snugly on to a nut. A hole diametrically across the tube allows a tommy-bar to be inserted to twist the tool. The socket spanner has a shaped socket to fit the nut, and a polygonal hole on the back surface to take a corresponding rod by which the socket is twisted for unscrewing or screwing the nut. Commonly one end of the bar is straight; the opposite end is bent at right angles for ease of application in awkward positions. The box spanner resembles the tubular type but is formed from solid metal, and has a T-handle, or a hole in which a tommy-bar can be inserted.

A ratchet spanner has the turning member connected to the lever by a ratchet, which can be used for right- or left-handed rotation, or fixed for use like an ordinary set spanner. Air-operated or electrically driven nut-runners are used for jobs where many nuts have to be put on bolts. The spanner unit resembles the socket spanner, and is rotated and given impact by a combined rotation-percussion mechanism in the driving tool.

Spar. In mineralogy, term used for crystallised minerals. The word is usually qualified by a name indicating the mineral, e.g. calc-spar, fluorspar, etc. The word is also used for part of the rigging of a ship. *See Ship.*

Sparassis Crispa. Fine edible fungus of the family Thelephoraceae, growing on the roots of pine



Sparassis Crispa. Edible fungus that grows in pine woods upon the roots of the trees

trees in woods. From a thick, fleshy base the fungus repeatedly branches, the ultimate divisions taking the form of brittle plates more or less twisted, and of a cream or pale brownish tint. The entire mass is ordinarily the size of a man's head, but may be 1½ ft. in diameter. In a raw state it has a nutty flavour.

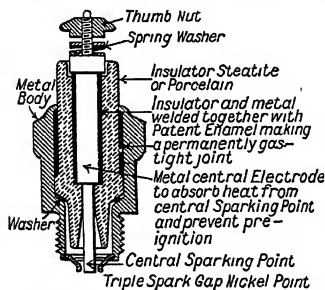
Sparaxis. Genus of bulbous or tuberous perennials of the family Iridaceae, natives of Africa. They have a few sword-shaped or lance-shaped leaves, and rather large tubular flowers of yellow, white, or purple, variously spotted or mottled. *S. bulbifera* has edible tubers.

Spark. Small shining body of light, usually a small ignited particle shot off from a fire. An electric spark is a disruptive discharge of electricity which takes place between two conductors at different potentials when the electrical resistance of the medium between them breaks down. The length of a spark increases with the

potential difference, and varies with the medium and, for a given voltage, with the form of the conductors. In air at normal pressures between spherical electrodes 2 cm. diam., it requires 8,500 volts to obtain a spark 2 mm. long, and 72,000 volts for a spark 40 mm. long. With point electrodes much smaller voltages are necessary.

Spark Plug. Electrical device for igniting the explosive charge in an internal combustion engine (*q.v.*). There is a gap, one side of which is "earthed" to the engine frame, the other side being insulated from the frame and subjected to a sufficiently high voltage to cause a spark to pass across the gap at the required moment. The voltage required depends upon the width of the gap and the density and temperature of the explosive mixture surrounding the plug. The gap width depends upon speed, compression, and position of plug, but its average is about 0.02 in., requiring a voltage of 4,000 to 5,000 under working conditions.

The plug body, to which the external points of the gap are fixed, is screwed into the cylinder head, making good metallic contact, and fitted internally with a tube of insulating material (usually porcelain or mica) which is secured by a nut and insulates a small metal conducting rod passing down the centre. At its upper end this rod is screwed and fitted with a nut making electrical connexion with an insulated wire from the magneto or induction coil distributor. The insulating bush must withstand high temperatures and



Spark Plug. Diagram explaining construction. *See text*

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voltage. When leaded fuels are used the central electrode is often made of tungsten or nickel. *See Magneto; Motor Vehicle.*

Spark Transmitter. Device for obtaining electrical oscillations of radio frequencies by suddenly short-circuiting a charged condenser through a suitable induc-

tance and spark-gap. With the development of the thermionic valve this type of wireless transmitter has almost disappeared.

Sparrow. Genus of Passerine birds, of which the best known is the house sparrow (*Passer domesticus*). This, the familiar small, black-streaked brown finch, has followed man in his advance over the globe so thoroughly that its original country is now uncertain. Hardiness, impudence, cunning, and fecundity have made the sparrow the dominant species of small bird. There are three or four broods in the year.

The bulky and untidy nest is made of whatever materials are handy—hay, straw, roots, rag, string, bits of paper—but always lined with soft feathers. The eggs are white, tinged with blue or green, variously streaked or spotted with brown or purple. Though destructive, the sparrow eats innumerable insects, and is a useful scavenger. The male is distinguished by his black throat and by his coloration, being more ashy than the female.

The tree sparrow (*P. montanus*) is slightly smaller, and has brown plumage, with a white collar around the throat and two white bars on the tail. It occurs locally in England and Scotland, but is rare in Wales and Ireland. It nests in hollow trees, under the thatch of old buildings, and in holes in rocks; and rears two or three broods in the season. *See Accentor.*

Sparrow Force. Guerrilla force operating in Timor, E. Indies, in the Second Great War. After the Japanese occupied the island in 1942 an Australian, Dutch, and native force was formed which harried the enemy. It was supplied from Australia, after establishing radio contact with Darwin when it had been isolated for a year, and continued to harry the Japanese until their general surrender in 1945.

Sparrow Hawk (*Accipiter nisus*). British bird of prey, found in most country districts. The plumage is bluish grey on the upper parts, and reddish white, barred with dark brown, on the under parts. The tail is barred with grey and black, and the beak is blue. The female, 3 ins. longer than the male, has brown upper parts, while the under parts are barred with light and dark grey. This bird is very destructive in game coverts during the breeding season. *See Eggs colour plate; Hawking.*

Sparta. One of the two most renowned cities of ancient Greece, the chief of the Dorian division of

the Hellenic race, known also as Lacedaemon. The town lay in Laconica, the S. division of the Peloponnese, remote from the sea and hard for an enemy to reach. The rule of the Spartans extended over Laconica, and sometimes a good deal farther. The Spartans themselves, who occupied the open town of Lacedaemon, were a small group of Dorian clans forming a military caste which, after the Dorian conquest about the 11th century B.C., established their supremacy over the rest of the tribes in that part of the country, whom they called Perioeci (q.v.).

The Spartan city state was a compromise between monarchy, oligarchy, and democracy. Sparta had two kings, reigning jointly, with limited powers save for the absolute control exercised by one or other of them over armies in the field. Ordinary conduct of administration was in the hands of the aristocratic council; but the actual supreme control, the ultimate authority, was in the hands of the ephors, officers annually elected or chosen by lot from among the free Spartans, the democracy. The joint kingship probably arose from the union of two tribes. The nobles secured an effective predominance through the right of naming the supreme officers of the state.

Bred to be Soldiers

The Spartan system was directed to a single supreme end, that of military efficiency. Spartans were bred to be soldiers, contemptuous of all the amenities of life, no less so of pain and death. They were trained not to eloquence but to curtness of speech; all luxuries were prohibited; courage was their one supreme virtue; the women were bred to become the efficient mothers of soldiers.

The Spartan system was by tradition universally attributed to a law-maker named Lycurgus (q.v.). During the 8th and 7th centuries, the Spartan state was engaged in establishing its supremacy over the greater part of the Peloponnese, in the suppression of Messenia, and in the struggle with Argos, long its rival for the hegemony. Military superiority was at length thoroughly established, and Sparta became the recognized head of all Greek states acting together for military purposes.

But Sparta was sluggish, slow to act, not easily moved by considerations of justice, and still less of generosity. When the Ionian cities of Asia Minor revolted against the domination of Persia, it was Athens, not Sparta, which sent

them aid, 499 B.C. When Darius demanded from the Greek states earth and water, the symbols of submission, Sparta refused as defiantly as Athens, but when in 490 B.C. the great king sent a punitive expedition, the Spartans dallied before sending their troops to aid the Athenians, and it was the Athenians who, single-handed, drove the Persians back into the sea at Marathon. Ten years later, 480, when Xerxes poured his vast armies overland into the Greek peninsula, the Athenians took the seas, and the Spartans with their advance guard held the pass of Thermopylae, where under their



Sparta. Map of the state of Laconica, the territory of the city of Sparta

king Leonidas the famed Three Hundred fought and fell. To Athens, not to Sparta, belongs the glory of the sea-fight at Salamis in the same year; but it was under the leadership of the Spartan king, Pausanias, that the Greek armies won the battle of Plataea (q.v.).

With the prestige won by Athens in the Persian wars begins the rivalry between Athens and Sparta for the leadership of the Hellenic world. Athens made herself supreme on the seas, and supreme in literature and art; but Sparta still sought to be the dominant power. In 431 the definite struggle began. Ten years of contest left the fight drawn, and the war was temporarily suspended; but Athens dissipated her power in a disastrous expedition to Sicily, and in 412 Sparta renewed hostilities. Athens was rent by political dissensions, yet it was not till the Spartan general Lysander realized that Athens could not be crushed until her naval power was broken, and annihilated the Athenian fleet at Aegospotami, 405, that Sparta achieved the decisive victory.

For 25 years Sparta was the dictator of the Hellenic world, but in 379 the city of Thebes, in Boeotia, revolted against her domination. Under the leadership of Epaminondas (q.v.), the Thebans, after a long struggle, not only won their own freedom, but for a time the supremacy of Greece. The Spartan ascendancy was never recovered after the great Theban victory at Leuctra in 371. The Theban ascendancy sank almost as rapidly as it had risen on the death of Epaminondas at Mantinea in 362, and a new power—that of Macedon—was coming upon the stage. The day of the small city states was over when Philip of Macedon won his decisive victory at Chaeronea in 338. Greece passed under the supremacy of Macedon, and Sparta sank almost into insignificance.

Just about a hundred years later she enjoyed a brief revival under her reforming king Cleomenes, but with his fall in 221 she sank again; nor did she play at all a glorious part in the unsuccessful efforts of Macedon and the Grecian states to stay the conquering progress of Rome in the first half of the 2nd century. Nevertheless, incorporation of Greece in the Roman prov. of Macedonia was not formally completed until 146 B.C. (See Greece; consult Histories of Greece, A. Holm, Eng. trans. 1894-98; G. Grote, new ed. 1907; J. B. Bury, new ed. 1908.)

Sparta today is the capital of the Greek dept. of Laconia. Pop. 5,800.

Spartacists. Group of extreme Socialists (Ger. *Spartakusbewegung*) which came into being in Germany, particularly Prussia, at the end of the First Great War. Influenced by the Bolshevik victories in Russia in 1917, they derived their name from Spartacus (v.i.), leader in the Servile War against Rome, 73-71 B.C. The leaders in their attempt to set up a proletarian dictatorship were Karl Liebknecht and Rosa Luxemburg. After both had met their deaths in 1919 through the police of Noske, right-wing Socialist minister of the interior, the movement lost drive and importance, but it may be regarded as the forerunner of the German Communist party.

Spartacus (d. 71 B.C.). Thracian soldier who commanded the insurgents in the third Servile War of Rome. Originally a shepherd, he was taken prisoner by the Romans and trained in the gladiators' school at Capua, whence in 73 B.C. he escaped with 70 others to the

crater of Vesuvius. Having scattered a blocking force, he gathered an army of runaway gladiators and other slaves, estimated at 100,000 men, and devastated Italy from end to end, displaying remarkable military skill and strenuously endeavouring to restrain the excesses of his men. In 71 he was defeated and slain by Marcus Licinius Crassus. *See* Servile Wars.

Sparteine. Alkaloid obtained by extracting broom-tops (*Cytisus scoparius*) with acidulated water and distilling the extract with caustic alkali. Sparteine is an oily liquid with a bitter taste. Its salts are used in medicine in the treatment of heart disease.

Spartel. Cape of Africa. On the N.W. coast of Morocco, in the international zone, it is at the entrance to the Strait of Gibraltar. Its height is 1,020 ft.

Spasm. Involuntary contraction of a muscle or group of muscles. A short, repeated contraction or twitching of a muscle is known as a clonic spasm, a continuous contraction as a tonic spasm. Spasms may be due to hysteria, reflex irritation of a nerve, or various diseases of the nervous system. A mild form of hysterical spasm, in which a group of muscles are contracted at intervals, causing, for example, lifting of the eyebrow or pulling down of an angle of the jaw, is known as habit-spasm. A severer form is termed a tic.

Spaté (Dutch *spuiten*, spout). Term applied to a mountain torrent in flood. When heavy rains or the sudden melting of snow brings freshets down the rocky bed, the river is in spaté.

Spathe (Gr. *spathē*, broad blade). In botany, the sheathing bract enclosing one or several flowers. A common example is seen in the narcissus. A fleshy spike of flowers covered by a spathe is called a spadix. The object of the spathe is to protect the young flowers, and after the latter expand it usually withers or falls off. *See* Spadix.

Spathic Iron Ore. The technical name for this substance is siderite (*q.v.*).

Speaker. Presiding officer of the British house of commons. The first person to receive the title was Sir Thomas Hungerford in 1377. He and his successors were called speakers because it was their duty to voice the wishes of members of the house to the king. The speaker is elected by the members, and receives a salary of £5,000 a year

and a residence. In order of precedence he ranks immediately below the lord president of the council and above the lord privy seal. He represents the commons on ceremonial and other occasions, and is made a viscount and pensioned on retirement. He takes no part in party politics during his term of office. Col. D. Clifton Brown, M.P. for Hexham, became speaker in 1943. The lord chancellor is the speaker of the house of lords. Some legislatures modelled on the English one call their president the Speaker, *e.g.* the house of representatives in the U.S.A. and the two houses of the Canadian legislature. *See* Committee; Parliament; Ways and means.

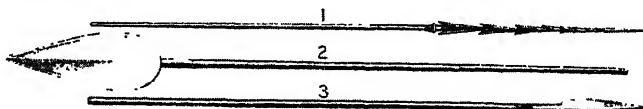
Spear (A.S. *spere*, perhaps cognate with *spar*). Offensive weapon, consisting of a sharply pointed

Europe. It is widely cultivated for culinary purposes. It has creeping, underground stolons, erect aerial stems, and opposite, oval-lance-shaped leaves, with pungent odour. The stems end in spikes of whorled purplish flowers.



Sir Edward Spears, British soldier

Spears, Sir Edward Louis (b. 1886). British soldier and politician. Born Aug. 7, 1886, and educated privately, he entered the Kildare militia in 1903, passing to the 8th Hussars 1906, and during the First Great War, in which he was four times wounded and won many British and foreign decorations,



Spear. 1. Barbed weapon used by Fiji Islanders. 2. Broad-headed Sudanese spear. 3. English hunting spear of the 16th century

shaft, used in war and the chase. It may be thrust or hurled. Specialised forms are the pike, lance, javelin, dart, arrow, and bayonet. The shaft, of varying length, is usually of wood, and the pointed head of metal. A bone point probably succeeded the charred end of a stick, and in the Palaeolithic age flint spearheads already occur. In the late Bronze age spearheads, with sockets or tangs, and sometimes barbs, were cast in moulds. The spear was the chief weapon in the Homeric age. The later Greeks and Romans used spears hurled with the aid of a thong attached to the middle of the shaft.

Many types of spear, headed with metal, bone, chipped flint, and other kinds of stone, are used at the present day by backward races, for fighting, hunting, and fishing, the tips being sometimes poisoned. Among civilized races the spear, apart from forms like the lance, is used chiefly for pig-sticking and spearing eels. *See* Anglo-Saxon Antiquities; Arms; Lance; Pike.



Spearmint. Leaves and flower whorls

Spearmint (*Mentha spicata*). Perennial herb of the family Labiatae, native of

rose to be brig.-gen. and head of the British military mission to Paris, 1917-20. He was National Liberal M.P. for Loughborough, 1922-24, and Conservative M.P. for Carlisle, 1931-45. In 1940 he was made a major-general and was British liaison officer to the French prime minister. He headed a mission to Syria and Lebanon in 1941, and from the next year, when he was knighted, until 1944 he was minister there. Spears married in 1918 the novelist Mary Borden (*q.v.*). His books include *Liaison*, 1930; *Prelude to Victory*, 1939.

Spearwort (*Ranunculus lingua*). Perennial herb of the family Ranunculaceae, native of Europe

and temperate Asia. It is found chiefly in marshes and ditches. The hollow stem is about 3 ft. high, with large, stalkless, lance-shaped leaves that clasp the stem at their base. The fine, golden-yellow flowers are an inch and a half across. The lesser spearwort (*R. flammula*) is similar, but is



Spearwort. Flower and blossoms of *Ranunculus flammula*

smaller in all its parts. The lower leaves are stalked and oval, the upper stalkless and lance-shaped.

Special Air Service. Unit of the British army. Formed in 1941, it consisted of selected parachute troops, trained on commando lines, expert in navigation, and skilled in all types of weapons. They operated in small formations, rarely more than 12 men, and were dropped behind enemy lines or in occupied territory to sabotage selected targets. The unit first went into action in Nov., 1941, when it unsuccessfully attempted to destroy a German aerodrome in France. The next month a number were dropped near Benghazi and destroyed a German airfield and 100 aircraft. Until 1943 the Special Air Service was operating behind the enemy lines in N. Africa. The regiment subsequently played a notable part in the invasions of Sicily, Italy, and Europe, creating havoc behind the enemy lines by disrupting communications. The disorganization of German resistance in depth in France after Gen. Patton's breakthrough in Normandy was largely due to the S.A.S., working in conjunction with the Maquis. After the Second Great War, only a cadre of Special Air Service personnel was retained. In 1947, the Artists' Rifles, a Territorial unit, was converted into a Special Air Service regiment.

Special Area. British district with a high level of unemployment. Formerly known as a distressed or Depressed Area (*q.v.*), after the Second Great War it was called a development area.

Special Case. In English law, a statement of facts to be laid before the judge of the high court, so as to obtain a decision upon a point of law. In any action the parties may agree on a joint statement of the facts, and ask the court to say who, in law, is in the right. An arbitrator may be asked to state his findings in the form of a special case, in which event he must say what are the facts as he finds them, and then one of the parties moves the court for judgment on these facts. Justices of the peace may state a case for the opinion of the high court. They must state a case if asked to do so.

Special Constabularies. In the U.K., auxiliary bodies drawn from the citizenry to assist the regular police in times of special danger or emergency. Under the Special Constables Act, 1831, any able-bodied person refusing to serve is liable to a penalty. Special

constables were sworn at the time of the Reform riots, 1831, and during the Chartist demonstrations, 1848, when one was the future Napoleon III, then living in London. They were called out in the general strike, 1926. In both Great Wars special constables helped in routine duties and air raids; in the First they were enrolled on a part-time basis, but in the Second some worked full time. *See* Constable; Police.

Special Licence. A form of marriage licence granted on certain conditions, and in exceptional circumstances. Special licences are granted only by the archbishop of Canterbury, and enable the holder to be married at any time or place without previous residence in the district. The applicant for such a licence must produce satisfactory reasons why it should be granted. Special licences are issued by the Faculty Office, 1, The Sanctuary, Westminster, S.W.1, the fees amounting to £25. *See* Marriage Law.

Special School. Institution for children with some mental or physical disability. *See* School, p. 7365.

Special Service Troops. These are more familiarly known as commando units. *See* Commando.

Specialty. In English law, a contract made under the seal of the parties to it, *i.e.* a deed. An action on a specialty may be brought at any time within 12 years from the date when the cause of action accrued. The period for other contracts is 6 years. No consideration is required for a contract by specialty.

Species (Lat., appearance, sort, kind). In logic, a group subordinate to a genus, consisting of individuals with certain attributes in common. In biological classification, a species is a group intermediate between a genus and a variety. The division of living things into kinds or sorts sufficiently discontinuous and distinct to make it possible to place an individual in the great majority of cases, unerringly among its fellows is a fact of nature. It is usually taken for granted, but it is by no means clear how this fact of nature came into being. There seems to be no *a priori* reason to expect that when metabolism began, that is to say when certain proteins occurred and behaved as their structure and environment required, they should become progressively differentiated from one another; but they did. The process of differentiation by a series of steps taken through time

amounts to a kind of logical division of living material based fundamentally on the occurrence or non-occurrence of a change of structure in a gene (mutation, *q.v.*). Further, once a mutation has occurred, then, if the mutant gene is viable and coexists with the unchanged original form, not only do two alternative forms, two kinds, of living things exist where there was one before, but there is an increased chance of further variation, because these two forms, being different, will be affected differently by random incidents, such as the arrival of radiations, and will be differently liable to later physical and chemical change. This is a consideration of great importance. It means that in a very special way the differentiation of living things is autocatalytic.

For a mutant form to survive it must continue to metabolise—that is, to use its environment for replication. Without an environment to be so used the notion of living has no meaning. For this reason a second, externally applied, force imposes linearity on the process of differentiation: not only are changes made possible or impossible by previous changes in molecular structure, but forms are made viable or inviable by the facts of the environment. Since, in an extreme case, the environments of land, water, and air are discontinuous, a discontinuity is imposed in this secondary way on the lines of development and differentiation followed by rabbits, trout, and sparrows. In those forms where no fusion of individuals occurs in any kind of sexual process, kinds or species will be differentiated as a result of the considerations described. It is often very hard to distinguish such kinds, and in pathogenic forms on which most work has been done it is often necessary to distinguish kinds or "strains" of organisms by their pathological effects.

A very great complication is introduced into the whole concept of the species by the fact of sexual fusion. The moment two individuals fuse the whole validity and integrity of the groups defined by the processes outlined is imperilled. The dichotomous logical division implemented by mutation fails: the middle is no longer excluded because the heterozygous individual has both changed and unchanged genes. The group set up on the simple dichotomous system described becomes immediately explosive.

The only group which can maintain its validity in these circumstances is one within which the fusion of individual gene-sets is rigidly contained. The functional species in nature is, therefore, the breeding group, the group within which genes circulate. The discontinuity, in nature, is between such groups, which are the natural species; these are the groups upon which natural selection works, often giving them specific characters, not, however, always easily recognizable.

Specific Gravity. The ratio between the weights of equal volumes of any substance and of some other substance that has been chosen as a standard. For gases the standard chosen is hydrogen or air; for liquids and solids, water. The ratio is usually determined at some standard pressure and temperature. Water is at its maximum density at 4° C., and specific gravities of other liquids and of solids are usually defined at that temperature.

The specific gravity of solids and liquids is determined generally by methods based on the law of Archimedes that a solid, floating or immersed in a liquid, loses weight equal to that of the liquid it displaces. If, therefore, the solid is totally immersed, the loss of weight is equal to the weight of a volume of liquid the same volume as that of the solid. From this the specific gravity of the solid may at once be obtained, since the ratio of the weight of the solid to its loss of weight is the same as the ratio of the specific gravity of the solid to that of the liquid.

Special balances are used to enable the solid to be accurately weighed in air and in water. The specific gravity bottle is a glass flask fitted with a stopper containing a fine hole. By this means the bottle may be completely filled. It is weighed empty and full of water, and afterwards full of a liquid of unknown specific gravity. From these weightings the specific gravity of the liquid may be determined.

Hydrometers (*g.v.*) will also determine the specific gravities of liquids. A third method of obtaining the relative densities of two liquids is by immersing an inverted U-tube in the liquids, one leg in each liquid. The bend of the tube contains an opening, leading to a short side tube with rubber tubing and clip, by which the liquids may be drawn up by suction. The heights to which they rise are inversely proportional to their densities. For non-mixing

liquids two equal volumes may be poured into an ordinary U-tube; the lengths of the two columns enable the relative densities to be calculated.

The specific gravity of a gas is generally found by making use of the law that the rate of effusion of a gas varies inversely as the square root of its density, for a given difference of pressure on each side of the opening through which effusion is taking place.

Specific Heat. Quantity of heat necessary to raise the temperature of 1 gram of a substance through 1° C. at any given temperature. If 100 grams of water at 100° C. is mixed with 100 grams at 0° C. the temperature of the mixture is approximately 50° C. But if 100 grams of copper at 100° C. is placed in 100 grams of water at 0° C. the resulting temperature of the water and copper is about 9.1° C. The heat given out by the copper in cooling through 90.9° C. has heated an equal mass of water through 9.1° C. The copper requires much less heat to raise its temperature than does the water; in fact, its specific heat is only about one eleventh that of water.

The amount of heat necessary to raise the temperature of a substance through 1° varies at different temperatures, and so the degree of temperature at which the increase by one degree is made should be specified. If the specific heat of water at a temperature of 15° C. is taken as unity, then the specific heat of water at 5° C. is 1.0041. That is, it takes more heat to raise a gram of water from 5° to 6° than it does from 15° to 16°. Specific heat of metals falls rapidly as absolute zero is approached.

Strictly speaking, the term specific heat should refer to the ratio between the heat capacity of a substance and that of water. Since, however, the unit of heat, the calorie, is itself defined in terms of the heat capacity of water, this ratio has the same numerical value as the heat capacity per gram, and specific heat is now customarily used both for the ratio and for the absolute value in cal gm⁻¹ deg. ⁻¹.

The usual method of determining the specific heat of a solid is to heat a mass of the solid to a known temperature, and then immerse it in a vessel containing a known mass of water. The temperature of the vessel, known as the calorimeter, is noted at the beginning and end of the experiment, and

proper allowances are made for the escape of heat by radiation, etc.

The specific heats of gases are more difficult to determine than those of liquids and solids, not only on account of the comparative bulk of the gases, but because they have different specific heats according to whether they are allowed to expand or not when heated. The heated gas is passed through a metal worm heated to a known temperature, and then through a spiral immersed in water. The rise in temperature of the latter enables the specific heat of the gas to be calculated at a constant pressure. If the volume is kept constant, a globe containing a volume of the gas at a known temperature is immersed in a steam calorimeter, and a certain quantity of steam is condensed in raising the temperature of the gas and the globe. From this the specific heat is reckoned.

In such experiments the thermal capacity of the container is a large fraction of the total thermal capacity of the system, and careful allowance has to be made for it.

The specific heat of most substances is different in the three states, gas, liquid, and solid. Thus the specific heat of ice is 0.5, of water 1, of steam 0.477.

Specific Inductive Capacity. The ratio of the permittivity of a substance to that of air (or more properly of a vacuum). The capacity of an electric condenser is increased by substituting some other dielectric for air between the plates. The permittivity, or dielectric constant, is a measure of the power of any given material to increase the electric influence between the plates of a condenser.

Spectaclemakers' Company. London city livery company. It received a charter in 1629, con-



Spectaclemakers' Company arms

trolled the spectacle trade until the end of the 18th century, and was granted a livery in 1809. In 1898 it inaugurated a scheme for granting diplomas to opticians. The offices are at Apothecaries Hall, Black Friars Lane, London, E.C.4.

Spectacles (Lat. *spectaculum*, show). Device for aiding subnormal eyesight and relieving headaches due to eyestrain. It consists of lenses made from high quality glass or plastic material with high light-transmitting property. These are mechanically supported before the eyes by

frames with supports over the ears, made of tortoise-shell or plastic. Metal frames are less commonly used than formerly, but rimless spectacles are regaining the popularity they lost to the "horn-rimmed" type which appeared after the First Great War.

The invention of spectacles is probably due to the Chinese, and there are references by Latin writers to an eyeglass of beryl worn by Nero. Alessandro de Spina, a Florentine monk, and Roger Bacon are both credited with their invention in Europe. Primitive spectacles are depicted in paintings of c. 1350, but it was not until the late 16th century that manufacture became general.

Lenses are divided into two main classes, spherical and cylindrical, each subdivided into concave and convex and their combinations. Concave lenses are used for the correction of myopia or short sight; convex for hypermetropia or long sight. Cylindrical lenses correct astigmatism. Prismatic lenses are suitable for double vision, and for the correction of strabismus or squint in conjunction with motor exercises of the external muscles of the eyeball, this science being known as orthoptics. Lenses in various tints can be worn in strong sunlight, and by industrial workers where heat and light absorption is a necessity. Crookes was largely responsible for their introduction. Bifocal lenses set right both distant and near vision in one pair of spectacles, and to Benjamin Franklin is given the credit for their invention.

For the correction of defective vision there have been evolved contact lenses which fit on the eyeball itself. They consist of a hollow shell of glass or plastic made to fit the anterior surface of the eyeball, the power of the lens being confined to a small central portion. Placed inside the eyelids they are almost invisible. *See Eye; Optical Glass; Sight Testing.*

Spectator, THE. Periodical essays begun by Joseph Addison, March 1, 1711, in succession to The Tatler. They were issued daily until Dec. 6, 1712, and then revived June 28, 1714, and issued thrice weekly until Dec. 20 the same year. In descriptive, critical, anecdotal, whimsical, and humorous fashion the essays taught sound social lessons of tolerance, moderation, and good sense. Of the 635 issues of the periodical, Addison wrote 274, signed by one

of the initial letters C. L. I. O., and Sir Richard Steele 240; the rest being by various minor writers; but whoever wrote the essay always did so as Mr. Spectator. *See Addison, J.; Coverley; Steele, Sir R.; Tatler, The.*

Spectator, THE. London weekly review. Taking the title of the periodical associated with the names of Addison and Steele, it was founded July 5, 1828. Its features include a commentary on the week's news, political and social articles, literary criticism, and correspondence. Notable always for its independence, it has exercised more influence than most London journals. Its editors have included R. S. Rintoul, 1828-58; R. H. Hutton, 1861-97; J. St. Loe Strachey, 1897-1927; and from 1932 H. Wilson Harris. For a time Sir Evelyn Wrench was in control, and he remains a substantial shareholder.

Spectrographic Analysis.

Method of analysis of materials which has developed largely during the 20th century into an important branch of science. Almost any material can be subjected to analysis with interesting results, for the presence of elements down to minute traces can be detected and often accurate quantitative estimates made. After Ångström in 1870 had made some extremely accurate measurements of wavelengths, Lockyer and Roberts suggested the possibilities of quantitative analysis with the spectrograph. Little further action was taken until the 1900s, when Hartley and de Gramont introduced *raies ultimes*, which formed a basis for the science. In 1909 Twyman designed a medium quartz spectrograph with fixed adjustment, and a few years later the large adjustable instrument. The science is used in the majority of industrial and research laboratories. But as no quantitative analysis can be made without standards which have first been accurately analysed by normal chemical methods, spectrographic analysis must be regarded not as a substitute for but as an aid to chemical analysis.

The method depends on several fundamental physical factors. Although wave mechanics have shown that it is not wholly true, it is convenient to use Bohr's simple conception of the atom as a nucleus with a series of electrons, carrying negative charges and revolving round the nucleus at high speeds in certain orbits. Each element holds a number of

characteristic electrons at various energy levels. The electrons prefer to move in orbits of minimum energy, known as stationary states. Emission of light corresponds to a transition from a higher to a lower energy level, and absorption of light to the reverse transition, the transitions being brought about by the fall of electrons, which have previously been displaced into higher energy levels by some input of energy or exciting force. This energy may be supplied by a flame, electric arc or spark, or a discharge tube, and, when the electron returns to its lower energy level, it causes the emission of energy which may be measured in terms of volts, calories, or frequency of light.

Atomic physics has shown that the emission or absorption of light can take place only along certain definable lines; hence light of characteristic wavelengths is emitted or absorbed. The prism or diffraction grating of the spectroscope (or spectrograph, a spectroscope with a camera attached) disperses these wavelengths to produce spectra, which, because of the inherent differences in energy levels in the various atoms or molecules, are characteristic of those atoms or molecules. Any element, owing to the distribution of energy inside the atom, can liberate or absorb energy only in certain characteristic quanta. If it is known that a certain element and no other emits light of certain wavelengths, then, if lines of those wavelengths are located, that element must be present in the source of light. Further, with some reservations, the amount of energy released at those wavelengths, i.e. the intensity of light emitted, is proportional to the amount of that element present.

Method of Analysis

So the system of analysis in emission spectroscopy is to burn the sample, which need be only a few milligrams in weight, in a flame, electric arc, or spark. The light from this source is passed through a spectrograph and a photograph or spectrogram is taken. By studying the positions of the spectrum lines it is possible to identify all the elements present in the sample. *Raies ultimes* or persistent lines will appear even if the element is present in amounts which would not be detected chemically or by any other means at our disposal. If the conditions of emission and of taking the spectrogram are

rigidly standardised, the intensity of blackening of certain lines will be proportional to the amounts of the elements present. If light is then passed through the developed plate and thence on to a photo-electric cell, the current given by the cell will be a measure of the density of blackening of the photographic plate, which is proportional to the intensity of the light causing this line and so to the amount of the element present. Errors due to slight variations in conditions can to some extent be compensated by the use of an internal standard.

Applications of the method range from the analysis of ores, rocks, minerals, clays, metals, and alloys, to forensic chemistry, crime detection, testing the purity of chemicals and other materials, and determination of the composition of stars, planets, and the sun. Methods have been developed to avoid taking a spectrogram by introducing the photo-electric cells into the spectrograph where the camera should be, and so getting a direct reading of the intensity of light emitted. With such an instrument it is possible to determine quantitatively seven elements in *e.g.* an aluminium alloy in 3-4 mins.

This emission spectroscopy has been augmented by the analysis of absorption spectra, where the reverse electron transitions are used and the absorption of light at certain wavelengths is measured. Much of this work is carried out in the infra-red region of the spectrum and on solutions or oils. Chiefly applied to organic and inorganic chemical compounds, it is of interest to biochemists, medical research workers, dye chemists, and others. See *Astronomy; Atom; Electronics; Photo-cell; Physics; Spectroscopy. Consult Chemical Spectroscopy, W. R. Brode, 2nd ed., 1948.*

F. D. L. Noakes

Spectroheliograph. Instrument for photographing the prominences of the sun. A development of the spectroscope, it was invented by G. E. Hale and M. Deslandres, and enables different layers of the sun's atmosphere to be studied in mono-chromatic light, that is to say, light of one kind or, more scientifically, of one wavelength.

The ordinary spectrum of the sun is spread out from a slit through which its light passes. In the spectroheliograph a second slit is used, so that only a very narrow portion of the spectrum is able to reach the photographic plate. This secondary slit is so adjusted that it can be made to isolate any desired spectrum line, *e.g.* the K line of calcium or the red line of hydrogen, and allow the light passing through this line only to fall on the photographic plate. By allowing the sun's image to travel across the first slit, while the plate travels behind the second slit, an image of the sun is built up strip by strip, as photographed by light proceeding from the calcium in the sun.

Adaptation of the spectroheliograph to the ciné-camera was accomplished by McMath and Hulbert of the university of Michigan, the device being known as a spectroheliokinematograph.

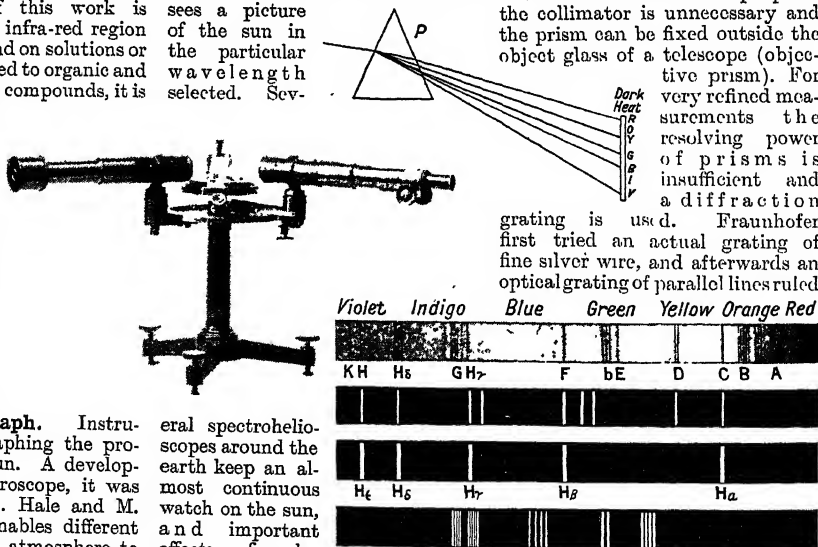
Spectrohelioscope. Instrument for viewing the sun in light of one particular wavelength. Invented by G. E. Hale in 1926, it is the visual counterpart of the spectroheliograph (*v.s.*), the eye taking the place of the photographic plate. The primary image of the sun is kept still, as is also the observer's eye, but the two slits are moved back and forth in conjunction so rapidly that by the phenomenon known as persistence of vision the observer sees a picture of the sun in the particular wavelength selected. Sev-

tion on the earth have been thereby discovered.

Spectroscope (Lat. *spectrum*, something seen). Instrument by which light is resolved into vibrations of different frequencies, and can thus be examined and its properties defined. It generally includes a slit and a collimator to admit the light in a parallel beam, and a viewing telescope. The Littrow type combines collimator and telescope, making the beam pass twice through the same lens. With a camera replacing the eyepiece, the instrument becomes a spectrograph, and when equipped with measuring scales and circles, a spectrometer.

The actual analysis is effected in refracting spectroscopes by one or more prisms of glass, or other refracting medium, which, by causing rays of shorter wavelength to deviate more than longer ones, splits up the beam into a rainbow spectrum with the red rays nearest the thin edge of the prism. As the dispersion increases with diminishing wavelength, the violet end is spread out more than the red, and the dispersion is called irrational. Small direct-vision instruments are made with an odd number of prisms in one tube, the even numbers reversed and of denser glass, so that for some mean ray the deviations cancel each other, the instrument being used pointing directly towards the light.

For some astronomical purposes the collimator is unnecessary and the prism can be fixed outside the object glass of a telescope (objective prism). For very refined measurements the resolving power of prisms is insufficient and a diffraction grating is used. Fraunhofer first tried an actual grating of fine silver wire, and afterwards an optical grating of parallel lines ruled



Spectroscopy. Spectra of, from top, the sun, nebulae, hydrogen, and coal gas. A-H, Fraunhofer's sign-posts; H_α-H_ε, bright hydrogen lines; K, calcium line. Left, common form of spectroscope. Top, ray of light split up by prism P into rays of heat, Red, Orange, Yellow, Green, Blue, Indigo, and Violet. See text

by a diamond on plate glass. Later, silvered glass was used for reflection instead of transmission, and then speculum metal replaced the glass.

Diffraction spectra are formed in sets, first, second, third order, etc., on each side of the directly reflected rays, with the violet end nearest the central undisturbed image. An idea of them may be obtained by looking at the sun through a feather. Ruled gratings being expensive, cheap replicas, called Thorp gratings, are made by moulding melted celluloid on a ruled grating. Rowland's concave grating acts as its own condenser and focusing lens, thus avoiding the loss of light due to absorption. It yields a perfectly normal spectrum when used in certain positions.

Resolving power is the ratio of the wavelength to the smallest difference of wavelength actually separated by the instrument. With very narrow slit it nearly equals the number of lines in the whole grating multiplied by the order of spectrum considered. Michelson produced a grating with resolving power 300,000, and 1,000,000 is not considered impossible. He also invented a new form of optical grating called an échelon, glass plates of uniform thickness being arranged in steps. The highest resolving power is reached by interferometers, especially Michelson's. In these the analysis is produced by passing the ray between parallel plates of glass, one or both only partially silvered, the phase of emergent rays varying with the number of internal reflections. Consult *The Spectroscope and its Work*, A. F. Newall, 1910; *Experimental Spectroscopy*, R. A. Sawyer, 1945; *Telescopes and Accessories*, G. Z. Dimitroff and J. G. Baker, 1945.

Spectroscopic Binaries. A class of double or binary stars the components of which cannot be separated by the telescope, but which are revealed by periodic displacements in the lines of their spectra. These displacements are due to the relative motion of source and observer in the line of sight. Among the more notable spectroscopic binaries are Capella; Algol; Mizar, which is one of the stars of the Great Bear; Spica; and Beta Lyrae, of which the two components are nearly in contact. See *Doppler's Principle*.

Spectroscopy. Science which deals with the methods of production of the spectra from various sources of light, and also with their study. In 1672 Newton com-

municated to the Royal Society his famous theory concerning the solar spectrum, and in 1815 Fraunhofer discovered the dark lines in it which bear his name, but spectroscopy as a practical science really began with Kirchhoff's interpretation of the Fraunhofer lines in 1859. He suggested that the cooler gases and metallic vapours surrounding the incandescent body of the sun absorbed the lines which they themselves emit when incandescent.

Many known elements were soon proved to be represented, and incidentally several new ones were discovered on the earth, the first few of these being caesium, rubidium, thallium, and indium. The brighter stars showed similar spectra, some including lines attributed to helium, not then known to exist on earth, but since identified in cleveite and elsewhere. Other lines in the solar spectrum, intensified when the sun is low, are due to the atmosphere and are called telluric lines. Of Fraunhofer's sign-posts (A to H) the first two, A and B, are telluric, due to oxygen in the atmosphere; the rest are solar—C and F hydrogen, double D sodium, E and G iron, and H calcium. The spectrum of a light source is an emission spectrum, but media interposed in the path of the light superpose what is called an absorption spectrum by barring the passage of selected rays.

Since most organic substances possess selective absorption spectra in the infra-red (*q.v.*), infra-red spectroscopy is highly important in applied science.

The unit of wavelength (Ångström) is the ten millionth part of a millimetre, formerly called a tenth metre (1 m.)/(10¹⁰).

The International Ångström is defined by assigning the value of 6438.4696 Å to the wavelength of the red line of cadmium in specified conditions. An alternative is the green line (5461 Å) of isotopic mercury 128, produced by neutron irradiation of gold.

The simplest method of determining wavelengths with a prism spectroscope is to photograph a comparison spectrum, usually of iron, on the same plate and deduce wavelengths by interpolation. Flame spectra are the best for the alkaline group, the Bunsen flame being quite hot enough to volatilise them, and the oxyhydrogen blowpipe will suffice for the currency metals, gold, silver, and copper. But more refractory substances require the high tempera-

ture of the electric arc; the element under investigation being introduced either into the arc itself or into a hollow cone at the point of the positive carbon. An even more energetic action is obtained in spark spectra, the spark from an induction coil being passed between poles of the substance to be analysed, or between a platinum pole and a chemical solution of the substance. Some lines are sharp and some diffused at one or both edges. Bands, due to molecular compounds, are sets of lines crowding closer and closer towards one edge.

Zeeman discovered that rays from a light source placed in a magnetic field appeared widened, and with higher dispersion this widening proved to be a resolution into separately polarised rays, a doublet when viewed along the lines of force and a triplet when viewed at right angles to them. Sometimes the resolution goes farther still, one of the green lines of mercury being resolved into no fewer than nine lines.

Between the wavelengths of sets of lines belonging to the same element numerical relations have been found. Balmer's law for the hydrogen series was the first announced, but it is only a particular case of more general formulae adopted by different investigators. From these has been evolved the current theory which regards the atom as a nucleus with a definite number of associated electrons.

The interferometer is now adopted by the International Astronomical Union as the instrument for absolute wavelength determination, and the arc-spectra of cadmium and the rare gases are used as standards of wavelength.

Doppler's principle (*q.v.*) applied to light requires such high velocity of motion between observer and light source to make any appreciable difference to the enormous velocity of light that its only practical application is in astronomy. Applied to determine the rotation of the sun, it showed lines from the E. limb displaced towards the violet (indicating approach), and from the W. limb towards the red (indicating recession), as compared with the telluric lines which are, of course, unaltered by the sun's rotation, and can be readily identified in this way. The uprush of gas in sunspots is shown by the Doppler effect to be very marked. See *Dispersion*; *Light*; *Nebula*; *Prism*; *Star*. Consult *Spectro-*

scopy, E. C. C. Baly, 3rd ed. 1927; *Experimental Spectroscopy*, R. A. Sawyer, 1945.

Spectrum. Coloured bands formed by dispersion when a ray of light from any source is passed through a prism. Spectra are also formed by means of diffraction gratings. The visible portion of the spectrum varies from red, through orange, yellow, green, and blue to violet, but the spectrum is continued beyond the red and violet. The spectra of the sun, stars, etc., are crossed by dark lines, characteristic of the chemical elements. These have enabled the compositions of the stars, etc., to be stated. *See Spectroscopy.*

Specularite or **SPECULAR IRON.** Variety of haematite (*q.v.*), occurring as black rhombohedral crystals with a fine metallic lustre.

Speculation (Lat. *specere*, to look). Literally, a mental view, a theory, a statement of opinion that cannot be proved, *e.g.* one concerning life after death. The word has come to be used specially for a transaction not in the ordinary course of business, which has been entered into because on a mental view of the circumstances it seems to offer a chance of special profit through the movement of prices. Purchases in the ordinary way of business are not speculations; nor are ordinary investments, *i.e.* purchases undertaken primarily as a source of income. A speculation without adequate knowledge of the factors determining the outcome is a gamble.

Speculum Metal. Alloy of two to two and a half parts of copper and one part of tin. The alloy usually also contains a trace of arsenic. It is a hard, white, brittle metal, capable of taking an extremely high polish, for which reason it was once used in making mirrors for reflecting telescopes. It has been superseded to some extent by silvered or aluminised glass. The reflecting telescopes of Lord Rosse were made with speculum metal.

Spee, MAXIMILIAN, COUNT VON (1861-1914). German sailor. Born at Copenhagen, he had a distinguished career in the German navy, which he helped to create. In 1914 he was in command of the Far Eastern squadron, and on the outbreak of the First Great War escaped from China waters. On Nov. 1 he defeated Craddock's squadron at Coronel (*q.v.*). Spee behaved with modesty and chivalry after this success, until on Dec. 8 he was decisively beaten

by Sturdee at the battle of the Falkland Islands, he himself going down with his flagship, *Scharnhorst*. His name was given to the German battleship Admiral Graf Spee (*q.v.*). *See Falkland Islands. Pron. Shpay.*

Speech. Faculty of uttering articulate sounds with the mouth for the purpose of communication, which distinguishes man from the lower animals. The sound of the voice is produced by a current of air passing through the air passages from the lungs, the cavities of the pharynx, mouth, and nose acting as resonators or sounding boxes. Fine movements of the tongue are essential for the production of speech; the formation of the jaw in some prehistoric men suggests that they did not possess full power of articulation. The co-ordination of the various movements necessary to produce articulate speech is governed by a special speech centre in the brain.

Defects in speech may be due to partial blocking of the air passages by catarrh, adenoids, etc., or to paralysis of the nerves supplying the muscles of speech. Hysteria may lead to loss of voice. Stammering (*q.v.*) is another defect.

Injuries to the speech centre in the brain cause loss of articulation or blurring of words. Sometimes there is a defect in the association of things and their names, a chair, for example, being spoken of as a house. This condition is spoken of as aphasia (*q.v.*), the cause most frequently being haemorrhage in the brain or apoplexy. *See Dumbness; Language; Larynx; Pharynx; Phonetics; Pronunciation; Voice.*

Speech House. Public building in the Forest of Dean, Glos. Built about 1680 as the verderers' court for the business connected with the forest, then as now crown property, it stands in the centre of the forest on Speech House Hill, a height 572 ft. above the sea. The building has become an hotel, but the verderers' court still meets there. *See Dean, Forest of.*

Speed. Rate of motion. Speed varies from the imperceptible movement of geological change to the velocity of light, and is usually expressed as distance travelled during unit time. The fastest time for a man walking is one mile in 6 min. 21.2 secs., and for running 100 yards in 9.3 secs., *i.e.* approximately 21 m.p.h. The longer the distance walked or run the lower the average speed; over a distance of a mile, a man's maximum running speed averages 14.9 m.p.h.

The fastest four-legged animal is claimed to be the cheetah, but it has never been officially or scientifically timed. The fastest timed animal is the greyhound, with a max. speed of over 39 m.p.h. A racehorse has maximum speed of 38.5 m.p.h., but only over a short distance; a fox can run at 26 m.p.h. The ostrich is the fastest animal on land; it can run at over 60 m.p.h. Of flying birds, the Arctic blue-throat has a speed of 180 m.p.h., the eagle 140 m.p.h., and the swift 100 m.p.h. The fastest insect is a small S. American fly, *Cephenemyia*, which is half an inch long and travels at over 800 m.p.h.

Mechanical devices enable man to increase his speed to many times that of the swiftest animal. A bicycle has been ridden $\frac{1}{2}$ m. in 24.8 secs. The official maximum speeds in 1950 were: aeroplane, 670.98 m.p.h., set up at Muroc, California, Sept. 15, 1948; motor road vehicle, 393.875 m.p.h., by John Cobb on Utah Flats (U.S.A.), Sept. 16, 1947; fastest speed on water, 160.32 m.p.h., by S. Sayers, on Lake Washington (U.S.A.), June 26, 1950; greatest railway speed, 125 m.p.h. attained by the L.N.E.R. engine Mallard, on the Grantham-Peterborough run, July 3, 1938. The fastest sustained speed by a train on regular service is 86.2 m.p.h. averaged by the Burlington rly. Twin Zephyrs diesel-traction train over 54.6 m. between East Dubuque and Prairie du Chein, U.S.A.

The highest speeds are those beyond human control, such as earth's orbital speed, 18,496 m. per sec.; solar motion, 12.1 m. per sec.; speed of light, approx. 186,300 m. per sec. A wind speed of 98 m.p.h. was recorded at Milldenhall on March 16, 1947.

Any speed in excess of that of sound (760 m.p.h. at sea level and decreasing to 675 m.p.h. at an altitude of 40,000 ft.) is called supersonic speed. Although rockets have exceeded 760 m.p.h., no human piloted vehicle reached the speed of sound until Sept. 6, 1948, when a U.S. piloted jet-propelled aircraft achieved 675 m.p.h. in a power dive from 40,000 to 30,000 ft.

Speedboat. Motor boat constructed for high speeds. It is usually of hydroplane design, to decrease resistance by displacing less water. Speedboats can be used safely only on calm water. In 1939 Sir Malcolm Campbell set up a water speed record of 141.74 m.p.h. on Lake Coniston in his speedboat Bluebird II, fitted with an aero engine. In 1950 S. Sayers, at Lake

Washington, U.S.A., reached 160-32 m.p.h. See Hydroplane; Motor Boat.

Speed Limit. Details of road speed limits imposed in the U.K. can be found under Motoring.

Speedometer. An instrument which records the speed of a motor vehicle. Usually a speedometer drive is incorporated in the transmission of the vehicle so that a flexible shaft drive may be taken to the spindle of the speedometer itself, which is mounted on the instrument board in view of the driver. In one form, the spindle carries a revolving magnet which exerts a drag on a light metal part separated from it by an air gap. This metal part may form the speedometer dial, being engraved with figures which come into line with a small aperture, or it may carry an indicator needle which moves over a stationary calibrated dial. In another form the spindle carries a small centrifugal governor; the movement of which by suitable levers and gearing is communicated to the needle which moves over a stationary dial. It is customary for speedometers to incorporate also a distance recording mechanism. This consists of numbered dials interconnected and set opposite to an aperture through which the mileage is read off. The rotation of the dials is effected by gearing from the spindle of the instrument.

Speedway Racing. Sport in which motor cycles race on a closed circuit. It originated in America in 1924, became popular in Australia soon after, and was brought from there to England in 1928. It is also popular in the British Empire and Holland. The machines used have no brakes or gears, and in the U.K. the engines must not exceed 499 c.c. Speeds of 65-70 m.p.h. are reached. The riders are in teams of six with two reserves. There are some 50 tracks of varying lengths in Great Britain. Speedway racing is one of the few major sports in Great Britain on which there is no betting.

Speedwell (*Veronica chamaedrys*). Perennial herb of the family Scrophulariaceae, native of Europe and Siberia. The opposite leaves are oval, strongly toothed, and stalkless, and the flowers, bright blue and shortly tubular, divide into four lobes, of which the upper and lower are broader than the side pair. There are only two stamens.

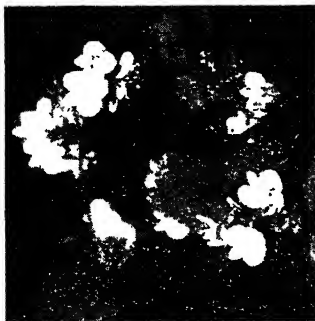
Speer, ALBERT (b. 1905). German architect and politician. Born at Mannheim, he was educated there, and studied architecture at

Karlsruhe, Munich, and Berlin. In 1931 he joined the Nazi party, and after Hitler's rise to power found favour as a designer of grandiose buildings. He planned the Reich chancellery in Berlin and the party headquarters at Nuremberg, becoming inspector-general of buildings in Berlin, 1937. After Todt's death in 1942 he became chief of war production, and was put in charge of reconstruction plans for bombed cities. By 1944 Speer was responsible for all German industrial output. Arrested in 1945, he faced the military tribunal at Nuremberg, was found guilty of war crimes, and on Oct. 1, 1946, sentenced to 20 years' imprisonment.

Spiegel, HAQUIN (1645-1714). Swedish poet. His literary fame rests chiefly on his Psalms, 1688, many of which are still sung in Swedish churches, and God's Work and Rest, 1685, a free translation of the Hexaëmeron of Arrebo (*q.v.*). He wrote also a history of the Swedish Church, 1707-08; and Paradise Lost and Refound, probably taking the idea from Milton. Spiegel was archbishop of Uppsala.

Speiss (Ger. *speise*, amalgam). Mixture of nickel, cobalt, iron, and other compounds. It collects at the bottom of the crucibles in which ores of minerals are being smelted with fluxes.

Speke. Locality of Lancashire, England. It is 7 m. S.E. of Liverpool by rly., and has an airport constructed in 1933 which was used for military purposes in the Second Great War and then for civil air lines. Factories in the district include one built at a cost of £1,125,000 by the ministry of Supply which was the world's biggest producer of penicillin and also turned out streptomycin. In 1946 Liverpool housing committee passed a scheme to develop Speke as a township with a pop. of nearly 22,000.



Speedwell. Blue flowers and toothed leaves of the common wayside plant

Speke, JOHN HANNING (1827-64). British explorer. Born in Somerset, May 4, 1827, he entered

the Indian army in 1844, and during his service travelled as far as Tibet. In 1854 he accompanied Sir Richard Burton into Somaliland. He and Burton made another journey from Zanzibar in 1857, pushing up to Lake Tanganyika; eventually Speke reached the Victoria Nyanza, having left Burton ill at Kaze. In 1862 Speke again made his way to Victoria Nyanza with J. A. Grant, and established the fact that the Nile is an outlet of the lake. He accidentally shot himself, Sept. 18, 1864. Consult his Journal of the Discovery of the Source of the Nile, 1863.

Speleology. The scientific study of caves. See Cave.

Spell (A.S. *spel*, a saying, story). Form of words equivalent to charm or incantation (*q.v.*). It is used in magic to conjure a spirit, to bewitch a person, to cure a disease. Spell, in the sense of a turn of work, is different, perhaps cognate with Ger. *spiel*, play.

Spelling. The use of letters to express the sound of words. In an ideal spelling system each sound would have only one sign to represent it, and each sign only one sound; there would be no pronunciation problems, and each letter would have a value when a word was spoken. In practice, however, spelling and pronunciation diverge, and the degree of divergence will depend upon several factors, including the literacy of the users of a language and the impact of other tongues upon it.

Thus English, which has over 40 sounds and 26 letters expressing these sounds unsystematically, is based upon a language, Anglo-Saxon, in which spelling and pronunciation were more nearly allied; but even in Anglo-Saxon one symbol represented several vowel sounds, and after the Norman Conquest the influence of the conquerors' different orthography and pronunciation made the divergence greater. The Anglicising of foreign words added greatly to the trend. The introduction of printing in the 15th century was a great stabilising influence upon English spelling, and the greater literacy which



J. H. Speke

printing brought created a conservative attitude to language.

In the 19th century there began to be demands by scholars and others for spelling reform, varying from the proposal for a completely new phonetic alphabet, by Bernard Shaw, to suggested modifications to lessen anomalies by Robert Bridges and philologists such as Furnivall. To a new phonetic alphabet there are practical objections, the greatest being that all printing machines would be rendered obsolete, and that the appearance of the new symbols would be an obstacle to an aesthetic appreciation of literature. Also, since pronunciation is in constant change, any phonetic system would in time become unphonetic.

Among European languages, Italian and Spanish are most nearly phonetic. See Orthography; Phonetics; Pronunciation. Consult Problems of Spelling Reform, Sir W. Craigie, 1944; Guide to Correct Spelling, W. O. Webster, 1947.

Spelt (late Lat. *spelta*). Variety of wheat (*Triticum sativum spelta*). Its brittle car easily breaks into short pieces, each of which bears a spikelet, and the grain cannot be properly threshed. Spelt was grown by the lake dwellers of Switzerland and the ancient Romans, and is still cultivated in central and S. Europe.

Spelter. This is a trade name for zinc (*q.v.*).

Spemann, HANS (b. 1869). German zoologist, born at Stuttgart, June 27, 1869. He was appointed professor at Rostock university in 1908, a director of the Kaiser Wilhelm institute of biology in Berlin, 1914; and took a chair in 1919 at Freiburg, where he was elected rector in 1923. He created and taught homology, the science of biologically identifying the function of organs seemingly widely different, and was an outstanding figure in the field of evolutionary mechanics. Experiments and numerous writings brought him the Nobel prize for medicine in 1935, the last one whose acceptance was tolerated by the Nazi regime. See Homology.

Spenborough. Urban district of Yorks (W.R.), England, 5 m. by rly. S.E. of Bradford. An amalgamation of Spenborough, Cleckheaton, Liversedge, Gomersal, Birkenshaw, and Hunsworth, it is in the borough constituency of Brighouse and Spenborough. It produces textiles, machinery, leather and plastic goods, wire, and carpets, and there are col-

lieries in the vicinity. The Red House at Gomersal is the Briarmains of Charlotte Brontë's Shirley. Market day, Sat. Pop. est. 34,500.

Spencer. Gulf of S. Australia. Lying between Eyre and Yorke Peninsulas, it is shallow, and receives no rivers of importance. Ports Pirie and Augusta are wheat-exporting harbours on its shores. Its maximum length and width are 200 m. and 80 m. respectively. Flinders sailed up the gulf in 1802, and discovered the great valley which runs N. from the head of the gulf to Lake Torrens.

Spencer, EARL. British title borne since 1765 by the family of Spencer. John Spencer (1734-83), grandson of the 3rd earl of Sunderland, was made a baron and a viscount in 1761, and Earl Spencer in 1765. His son, George John, 2nd earl, was first lord of the Admiralty, 1794-1801, and in 1806-07 a secretary of state. The 3rd earl is noticed below. Frederick, 4th earl (1798-1857), was a rear-admiral, afterwards serving as lord chamberlain and lord steward of the household. The 5th earl receives a separate entry. When he died childless in 1910 the title passed to his half-brother, Charles Robert (1857-1922), long a Liberal M.P. and during 1905-12 lord chamberlain. Albert (b. May 23, 1892) succeeded him as 7th earl. His seat is Althorp (*q.v.*), Northants, and an eldest son is called Viscount Althorp.

Spencer, JOHN CHARLES SPENCER, 3RD EARL (1782-1845). British statesman. Born in London,



3rd Earl Spencer, British statesman

May 30, 1782, eldest son of the 2nd earl, and educated at Harrow and Trinity College, Cambridge, he entered parliament in 1804, and was made a junior lord of the treasury in 1806, when his father was Home secretary. In 1827 his integrity and ability led to his selection as leader of the Whig opposition to Wellington, and in the Reform ministry of Grey, Viscount Althorp, as he still was, became in 1830 chancellor of the exchequer and leader of the house of commons, where he was largely responsible for carrying through the Reform Bill. His father's death in 1834 translated him to the lords, and Spencer withdrew from

politics and devoted himself to agriculture and the care of his estates. He died at Wiseton, Northants, Oct. 1, 1845. Consult Lord Althorp, E. Myers, 1890.

Spencer, JOHN POYNTZ SPENCER, 5TH EARL (1835-1910). British politician. Only son of the 4th



5th Earl Spencer, British statesman

earl, he was born in London, Oct. 27, 1835, and went to Harrow and Trinity College, Cambridge. For a few months he was in the commons, but in Dec., 1857, he

succeeded to the earldom. Already a leading sportsman and a commanding figure in society, he was in the household of the prince consort and the prince of Wales.

In 1868 Spencer became lord-lieutenant of Ireland, and he retained his office, though without a seat in the cabinet, until 1874. From 1880 he was lord president of the council; then in 1882 he went again to Ireland. A most influential convert, he followed Gladstone on Home Rule, and in 1886 was again lord president. From 1892 first lord of the Admiralty, he was Gladstone's choice as his successor in 1894, but when Rosebery was preferred he served him loyally. In 1902 Spencer became Liberal chief in the upper house, but by 1905 he was partially paralysed, and he took no further part in public life. He died Aug. 14, 1910. He had sold his fine library at Althorp to Mrs. Rylands in 1892. See Rylands Library.

Spencer, HERBERT (1820-1903). British philosopher. Born at Derby, April 27, 1820, he was privately educated. From 1837 to 1846 he was engaged in civil engineering, and he was sub-editor of *The Economist*, 1848-53. He opened his career as an author in 1842 with *Letters on the Proper Sphere of Government*, already noteworthy for their uncompromising individualism, and in 1850 published his first important work, *Social Statics*, in which an evolutionary theory of progress is clearly set forth. This was followed in 1855



Herbert Spencer, British philosopher

by the Principles of Psychology, in which such ideas are applied to the problems of mind.

Thus far, though evolution had provided the basis of his thought, he had dealt with many subjects in a fragmentary way. But having reached a conception of evolution as a universal process, he now perceived the possibility of making it the foundation of a comprehensive interpretation of life, mind, and society, and in 1860 he issued the prospectus of his *System of Synthetic Philosophy*. This system, which occupied him for 36 years, comprises ten volumes—*First Principles*, 1862; *Principles of Biology*, 2 vols., 1864; *Principles of Psychology*, 2 vols., 1872; *Principles of Sociology*, 3 vols., 1876–96; *Principles of Ethics*, 2 vols., 1889–92. Other works include *Education*, 1861; *The Study of Sociology*, 1873; *The Man versus the State*, 1884. Spencer had a nervous breakdown in 1855, and later became a complete invalid. He died at Brighton, Dec. 8, 1903.

In building his system, Spencer starts from the conception of philosophy as "completely-unified knowledge," and his purpose therefore is to reduce all knowledge to a coherent whole by taking the widest generalisations of the special sciences and establishing the universal truths under which the particular truths of such sciences may be subsumed. It is not the business of philosophy to explore the problems of absolute being, since, owing to its constitution, the human mind has no access to ultimate reality; the sphere of philosophy is that of phenomena only. Philosophy is a synthesis of the sciences.

Bases of Spencerian Philosophy

Having thus cleared the way by dismissing all ontological considerations, Spencer advances to his constructive task, which is the investigation of the processes by which the Unknowable Power manifests itself in the knowable universe, or, in other words, an interpretation of the universal transformation of things in terms of matter and motion. His basic principles are the persistence of force, with its corollaries, the transformation and equivalence of forces, the uniformity of law and the rhythm of motion; while his universal law is the law of evolution, which, restating his abstract formula in the simplest possible language, we may define as a change at once toward increasing diversity (differentiation) and

toward increasing definiteness and coherence (integration).

This law holds good of all phenomena, from those of the sidereal universe to those of social life; and having illustrated it in broadest outlines in *First Principles*, Spencer devotes his nine succeeding volumes to its demonstration in detail. In his *Biology* he traces the evolution of life, from its lowest cognizable forms up to man, through the continual interaction of organism and environment, incorporating in his law of equilibration (or the maintenance of a moving balance between the two) the Darwinian factor which he himself calls "the survival of the fittest."

In his *Psychology* he follows the concomitant evolution of mind from "the automatic actions of the lowest creatures," and in so doing undertakes the reconciliation of the conflicting schools of intuitionists and empiricists by showing that the intuitions of the individual are the results of the inherited and consolidated experiences of the race. In his *Sociology* he treats society as an organism, the changes of which are to be interpreted by the same universal laws of evolution.

In his *Ethics* he considers those "last stages in the evolution of conduct" which are "displayed by the highest type of being when he is forced, by increase of numbers, to live more and more in presence of his fellows," and here, as in the *Psychology*, affiliating empiricism to evolution, he exhibits our "moral intuitions," innate in the individual, as products of accumulated experiences of utility, at the same time advancing beyond the older utilitarians by deducing the laws of conduct from the conditions essential to the realization of the highest life. *See Ethics*; *Hedonism*; *Utilitarianism*.

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Spencer, Stanley (b. 1891). British painter. Born at Cookham, Berks, he studied at the Slade school. He made his native village the setting for compositions inspired by the New Testament, e.g. *Nativity*, *Christ Bearing the Cross*, and *Resurrection* (the last two are in the Tate Gallery). These mystical works, which followed the example of the Old Masters in depicting sacred and

angelic characters in contemporary dress, excited great interest. A distinguished mural painter, Spencer executed designs for the walls of All Souls' Oratory, Burghclere, inspired by experiences on the Macedonian front during 1914–18. His canvas of *Travoy's Arriving with Wounded*, Macedonia, is in the Imperial War Museum. *Mending Cows*, and *Swan Upping* at Cookham, revealed a Pre-Raphaelite influence in structural details. Member of the New English art club 1919–27, Spencer was elected A.R.A. in 1932. Having resigned from the academy in 1935, he was in 1950 reelected A.R.A. and made C.B.E. in Jan., and elected R.A. in March. *See Art illus.*, p. 665.

Stanley Spencer,
British painter

Spender, John Alfred (1862–1942). British journalist. Born at Bath, he was educated there and at Balliol College, Oxford. During 1886–90 he was editor of the *Eastern Morning News*, Hull, and in 1892–96 assistant editor of the *Pall Mall* and *Westminster Gazette*.



J. A. Spender,
British journalist

In charge of the latter from 1896 to 1922, he became the close friend of Asquith, Grey, and Haldane, though his status as political editor depended also on the fine literary style which he impressed on his newspaper. In 1919 he went with Milner's mission to Egypt. After retiring, Spender devoted himself to writing and to efforts towards restoration of Liberal influence. His political studies included *The Public Life*, 1925; *Fifty Years of Europe*, 1933; *Life, Journalism, and Politics*, new ed. 1935; *Government of Mankind*, 1938; and he wrote notable biographies of Campbell-Bannerman, and of the 1st earl of Oxford and Asquith (with C. Asquith), 1932. He was created C.H. in 1937, and died at Bromley, June 20, 1942. He was the brother of Edward Harold Spender (1864–1926), biographer and journalist, and the uncle of Stephen Spender (v.i.). *Consult Life*, H. Wilson Harris, 1946.

Spender, STEPHEN (b. 1909). British poet and critic. Son of E. H. Spender, he was born Feb. 28, 1909, and educated at University College School, and University College, Oxford. In the 1930s he was talked of with W. H. Auden and C. Day Lewis as a leader of the Left-wing intellectuals in poetry. He could deal in clear-cut imagery, and showed acute awareness of suffering, especially when moved by the Spanish Civil War. Collections of verse included *The Still Centre*, 1939; *Ruins and Visions*, 1941; *Poems of Dedication*, 1946. Co-editor of *Horizon*, 1939-41, Spender published *The Burning Cactus*, 1936; *Forward from Liberalism*, 1937; *Life and the Poet*, 1942. *European Witness*, 1946, deals with post-war Europe. *World Within World*, 1951, was autobiographical. With A. L. Gili, he translated, 1939, some of the poems of Lorca (*q.v.*).



Stephen Spender,
British poet.

Spener, PHILIPP JAKOB (1635-1705). Founder of the German Pietists. Born in Alsace, Jan. 13, 1635, and educated at Strasbourg, Basel, Tübingen, and Geneva, he was appointed a public preacher at Strasbourg in 1663, and about three years later at Frankfurt,



Philipp Spener,
founder of Pietists

where he founded the Pietist sect, which aimed at fostering spiritual religion in place of the dry dogmatism of Lutheran preaching. He became court preacher at Dresden, 1686, but retired in 1691 to Berlin, where his meetings were condemned. He died Feb. 5, 1705.

Spengler, OSWALD (1880-1936). German philosopher. Born at Blankenburg, Belgium, May 29, 1880, he went to Germany to study political and social history, art, the major sciences, and mathematics, before becoming teacher in the last subject at Hamburg, 1908. Three years later he settled at Munich and devoted himself to the propagation of original politico-philosophical views. He died May 8, 1936. As a result of the great success of the

first vol. of his massive work, *Der Untergang des Abendlandes*, 1918, Spenglerian societies were set up throughout Germany and in France and England. This work, the second vol. of which appeared in 1927, was translated into English as *The Decline of the West*. Spengler regarded as inevitable a conflict between West and East. He saw the history of man as arranged in a series of cultures which completed identical cycles, the last of eight cultures being Western civilization. This had passed its height, and democracy was giving way to dictatorship. As fatalism of this kind took hold in post-war Germany, Spengler was acclaimed the prophet of revolution.

Spennymoor. Urban dist. of Durham, England. It lies about 6 m. S. of the city of Durham and has a rly. station. Industries include coal mines and iron and steel works. Until 1950 Spennymoor was the name of a parl. div., it is now in the co. constituency of Durham. Pop. 13,870.

Spenser, EDMUND (c. 1552-99). English poet. Born in London of humble parents, though he claimed connexion with the Spencers of Althorp, he was educated at Merchant Taylors' and Pembroke Hall, Cambridge. After graduating M.A. in 1576, he spent some months among kinsmen in Lancashire, where he enriched his poetic vocabulary from the local dialect, and fell in love with the Rosalind of *The Shepheardes Calendar*. A



From a portrait in the possession of the earl of Kinross

literary Cambridge friend, Gabriel Harvey, called him to London, and introduced him to the earl of Leicester and his nephew Philip Sidney, whose friend Spenser became. *The Shepheardes Calendar*

(*q.v.*), published in 1579, brought him immediate fame.

Already introduced at court by his powerful patrons, Spenser went to Ireland in 1580 as secretary to the new lord deputy, Lord Grey de Wilton, whose remorseless methods of imposing order won his admiration. After filling various posts, Spenser was rewarded with an estate of 3,000 acres in Cork. His ideas on English colonisation of Ireland are to be found in his prose work, *A View of the State of Ireland*. During these years a close friendship sprang up between Spenser and Raleigh, and it was at Spenser's castle of Kilcolman, about 1589, that the poet showed to his friend the first three books of *The Faerie Queene*, on which he had long been at work. Raleigh induced Spenser to come back to England with him and bring it to the notice of Queen Elizabeth. Gratified by the flattering references to herself, she awarded the author a pension of £50. The story of this visit to London is embodied in the fine pastoral *Colin Clouts Come Home Again*, 1595.

Marrying in 1594 Elizabeth Boyle, the story of whose wooing and marriage Spenser tells in his *Amoretti* and *Epithalamion*, he had made Ireland his home, when in 1597 an insurrection took place, Kilcolman Castle was burned, and one of Spenser's children, it is said, perished in the flames. He died in London, Jan. 16, 1599, a broken man, and was buried next to Chaucer in Westminster Abbey. The chief productions of his last years, in addition to further instalments of *The Faerie Queene*, were a collection of minor poems entitled *Complaints*, with the shrewd satire, *Mother Hubbard's Tale*; *Astrophel*, an elegy on Sidney's death; *Prothalamion*, with its refrain, "Sweet Thames, run swiftly till I end my song"; and *Four Hymnes*.

Spenser's poetry reflects a critical period in English life, the transition from the medieval to the modern world. More than any other he recovered and created the harmonies of English verse, and the influence of this poets' poet, as Lamb rightly calls him, is powerful throughout the history of English poetry. Though his daring experiments in language, his archaisms, provincialisms, and new coinages were only in part repeated by his successors, he enriched the language.

A true child of the Renaissance, possessed as few others were with a power of expressing sensuous beauty, he marvellously harmonises Italian and classic culture with

the moral gravity and spirituality of the English Reformation, and combines the ardour of chivalrous romance with the awakening national pride of the Elizabethan age. A Platonic idealist, he sees in chivalry and all human institutions the shadows of eternal truths. He is no realist, is seldom dramatic or humorous, lacks constructive power, and can be involved and prolix, but in his visionary world of luxuriant fancy he is supreme. He has a rare gift of verbal music, and the Spenserian stanza is one of the great metrical discoveries. *See* Faerie Queene.

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Spermaceti (Lat. *sperma ceti*, sperm of a whale). Waxy substance obtained from the oil contained in the large skull cavity of the sperm whale. Mainly cetyl palmitate, it is hard, translucent, pearly white, and unctuous. Separating at a low temperature from the sperm oil, it is repeatedly washed with hot water and boiling potash lye. Spermaceti is used for making candles and dressing textiles, and as an emollient in ointments.

Spermatic Cord. Cord-like mass of structures consisting of the vas deferens, arteries, veins, and nerves, which pass down from the abdomen to the testes.

Spermatophytes. Botanical term for seed plants, one of the two primary divisions of plant-life. They include all those species which produce true seeds, containing an embryo which develops directly into a plant resembling its parent. It comprises two groups: the Angiosperms, or higher flowering plants, whose seeds are enclosed in fruits; and the Gymnosperms, whose seeds are not enclosed, but borne on special leaves or branches. *See* Botany; Cell; Plant.

Spermatozoon (Gr. *sperma*, seed; *zōon*, animal). Male germ cell. In the lowest form of life the spermatozoon and the female cell, or egg, are not dissimilar, but in higher forms the spermatozoon becomes a highly specialised active locomotor cell, and the female egg or ovum becomes a larger, more passive cell. The spermatozoon is provided with a head, body, and

tail, the first containing a nucleus of chromatin, the body the centrosome. The tail is a cytoplasmic thread, and provides the power for movement. *See* Embryology; Fertilisation.

Sperm Oil. Oil obtained from the cachalot or sperm whale. It is a useful lubricating oil because it does not readily become gummy or acid. *See* Whale.

Sperm Whale (*Physeter catodon*). Large Cetacean, also known as the cachalot (*q.v.*).

Sperrin. Range of mountains in N. Ireland. They extend E. to W., mainly between Strabane, Tyrone, and Draperstown, Londonderry, and in Sawel Mt. reach a height of 2,240 ft.

Spessartite. Rather rare, manganiferous variety of garnet (*q.v.*), possessing a deep red colour, occurring occasionally in acid igneous rocks like granite, and in lowly metamorphosed sedimentary rocks such as whetstones.

Spey. Second largest river in Scotland and the swiftest in the kingdom. Rising in the hills between Lochs Lochy and Laggan, it flows E. and N.E. through Inverness-shire and Morayshire, forms part of the boundary between the latter county and Banffshire, and enters the Moray Firth at Kingston. It is 110 m. long, and has valuable salmon fisheries. The district through which it flows is known as Speyside, the chief industry of which is whisky distilling.

Speyer or **SPEIER.** German name of the capital of the Palatinate, also known as Spire (*q.v.*).

Speyer, EDGAR (1862-1932). Anglo-German financier and collector. Born in Frankfurt-on-Main, Sept. 7, 1862, he was educated there, and joined his father's financial firm. In 1887 he took over the direction of the London house and in 1892 became a naturalised British subject. His firm was interested in the London underground railways among other undertakings. One of the founders of Whitechapel Art Gallery, and a notable benefactor of charities, Speyer was created a baronet in 1906 and a privy councillor in 1909. In 1914 he retired to Germany, and in 1921 was deprived of British nationality and honours on the ground of disloyalty to the king and unlawful communication with the enemy during the First Great War. He died Feb. 16, 1932.

Spezia (Ital. La Spezia). City and seaport of Italy, in the prov. of Spezia. It is situated on the Gulf of Spezia in the Riviera di Levante, 56 m. by rly. S.E. of

Genoa, amid fort-crowned hills, and was made the chief naval harbour of the country in 1861. It has an arsenal, docks, shipyards in which some of the largest Italian warships have been built, a school of navigation, barracks, and artillery, torpedo, and electrical works. Sailcloth, cables and other iron goods, furniture, and leather goods are manufactured; there is trade in olive oil, wine, fruit, and marble. Spezia is a sea-bathing and winter resort. Shelley was drowned in the gulf in 1822. In the Second Great War the harbour was heavily damaged in demolition raids and the cathedral suffered severely by bombing before Spezia fell on April 24, 1945, to the Allied 5th army. Pop. (1936) 106,119.

Spezia, SPETSÆ, OR PETSÆ. Island of Greece. Lying at the mouth of the Gulf of Nauplia, it is about 10 m. S.W. of Hydra and has an area of about 12 sq. m. On it is a small port of the same name.

Sphaerella (dim. of Lat. *sphæra*, a globe). Genus of single-celled Algae, more generally known as Haematococcus, but occasionally as Protococcus.

Sphagnales or **SPHAGNACEÆ** (Gr. *sphagnos*, moss). Order of mosses, consisting of the single genus *Sphagnum*, or bog moss (*q.v.*). *See* Moss.

Sphalerite or **BLENDE.** Chief ore mineral of zinc. Crystallising in the isometric-tetrahedral class, its atomic structure is face-centred cubic, similar to diamond. Although tetrahedral crystals occur, sphalerite is generally found in massive forms, either granular or compact. It varies in colour from yellow to brown and black; more rarely it may be green, red, or nearly colourless. Specific gravity is 4±0.1. Lustre is resinous to adamantine. In addition to zinc sulphide, it may contain iron up to 20 p.c., manganese, cadmium, mercury, rarely lead and tin, or traces of indium, gallium, thallium, silver, and gold.

Zinc sulphide (ZnS) occurs in two forms, sphalerite, stable at temperatures below 1020° C., and wurtzite, stable at higher temperatures. ZnS is deposited as sphalerite from alkaline solutions. Both forms are precipitated from acid solutions, the amount of sphalerite increasing with temp. and that of wurtzite with acidity.

Sphalerite is very closely allied with galena (*q.v.*). There is only one important field known where the deposit is worked for zinc only, namely, at Franklin Furnace, N.J. Most zinc deposits are found

in veins and lodes in igneous, sedimentary, and metamorphic rocks, or as replacements and disseminations in sedimentary rocks, especially limestones and dolomites. Commonly associated are pyrite, chalcopyrite, galena, calcite, barytes, fluorite, etc. Sphalerite is widely distributed; the most notable deposits occur at the Sullivan Mine, B.C.; Broken Hill, N.S.W.; Bawdwin mines, Upper Burma; in Oklahoma; and at Franklin Furnace.

Both names are derived from words suggesting deception (Gr. *sphaleros*, treacherous; Ger. *blenden*, to deceive) because the mineral often resembles galena but is found to contain no lead. See Zinc Ores.

Sphene (Gr. *sphēn*, wedge). Name of a variety of titanite (*q.v.*).

Sphenodon (Gr. *sphēn*, wedge; *odontes*, teeth). Lizard-like reptile of New Zealand, known to the Maoris as Tuatara, and now called



Sphenodon. Nocturnal reptile, somewhat similar to a lizard, that lives in New Zealand
W. S. Berridge, F.Z.S.

scientifically *Sphenodon punctatum*. It is the only surviving representative of the order Rhynchocephalia (snout-headed) of the reptiles. It differs from the lizards in having the quadrate bone, to which the lower jaw is attached, immovable; while the bones of the vertebrae are hollowed at both ends. The mandible is beak-like, and there is a pineal body, or rudimentary third eye, in the top of the skull. The skin is tubercled, and a crest of small spines runs along the middle line of the back and tail. The sphenodon is about 20 ins. long, and its colour is usually dark olive with yellow dots. It lives in burrows and comes out at night to feed on insects, worms, and other small creatures. The eggs are deposited in holes in the sand, and apparently do not hatch until about a year later. It is very sluggish in its movements, and seems to have been exterminated on the main islands of the New Zealand group.

Sphenoid Bone (Gr. *sphēn*, wedge; *eidos*, shape). Bone of complicated shape forming part of the base of the skull. A depression on

the upper part contains the all-important pituitary gland.

Sphere. Solid bounded by a surface which is everywhere equidistant from a fixed point, its centre. Every plane section of a sphere is a circle, and those made by planes passing through the centre are known as great circles. The shortest line joining any two points on the surface of a sphere is the arc of the great circle passing through the two points. The surface of a sphere is four times the area of a great circle, *i.e.* $4\pi r^2$ where r is the radius of the sphere. The sphere is the largest solid of given surface, and its volume is $\frac{4}{3}\pi r^3$, or two-thirds that of the circumscribing cylinder.

Sphere, THE. London weekly illustrated periodical. Established Jan. 26, 1900, by Hugh Spottiswoode of the firm of Eyre and Spottiswoode, and Clement Shorter (*q.v.*), who edited it from the start until 1926, it at once took rank with the foremost papers of its kind, being notable for excellence of illustrations, explanatory diagrammatic drawings, the high quality of its literary pages, and the piquant character of its Literary Letter. In 1912 it incorporated Black and White, in 1933 The Graphic. The Sphere is one of a group of associated high-class illustrated periodicals of which the chief is the Illustrated London News (*q.v.*).

Spherical Harmonics. In mathematics, certain functions which are of fundamental importance in the investigation of gravitational, electrical, and other attractions. Spherical harmonics depend upon a differential equation known as Laplace's equation, the method being due to the French mathematician. By means of this Laplace was able to calculate the attraction of the earth, and Gauss to formulate a theory of terrestrial magnetism.

Spherical Trigonometry. Branch of mathematics concerned with spherical triangles. Such a triangle is one formed on the surface of a sphere by the mutual intersections of three great circles. Such triangles have the same definitions of right-angled, equilateral, isosceles, etc., as triangles in plane trigonometry. The solution of any spherical triangle may be made to depend on that of a right-angled spherical triangle. See Triangle; Trigonometry.

Spheroid. In geometry, a solid generated by the revolution of an ellipse about one of its axes. An oblate spheroid is generated with the minor axis as the axis of rotation, and a prolate spheroid round the major axis. See Ellipsoid.

Sphinx (Gr. *sphingēin*, to strangle). Composite human and animal form which appears in ancient art. It is of Egyptian origin, and as such has the body of a lion and a human or animal head. Human-headed sphinxes are called androsphinxes; those with the head of a ram, criosphinxes; and those with a hawk's head hieracosphinxes. Assyrian and Babylonian sphinxes have wings, and the Greek sphinx consists of a winged lion with a female bust.

In Egyptian hieroglyphs the sphinx bears the name of Neb, or lord, and Akar, or intelligence, the whole figure symbolising force and intellect. For this reason large stone sphinxes were erected by the Egyptians as symbols of monarchy, the head of the reigning king being placed upon a lion's body (to symbolise strength) and the face bearded.

The oldest example, the Great Sphinx of Gizeh, in lower Egypt, is a recumbent image of a man-headed lion, hewn out of a rocky knoll near the pyramid of Khafra. It is 187 ft. long, the head 30 ft. long, the face 14 ft. wide, and the height to top of the head 66 ft. The features, once painted red, were marred by medieval Mameluke vandalism. Portions of the beard and uraeus are in the British Museum. In front of the breast Thothmes IV set up a granite slab, mentioning Khafra's name, to commemorate the digging of the image out of the drifted sand. It was worshipped as Harmachis, and there are remains of an open-air temple between the paws, with an altar of Roman date.

The next oldest sphinxes, a granite pair 7 ft. long, bear the name of Pepi I, of the VIth dynasty. Several examples from Tanis are attributed to Amenemhat III. Under the New Empire avenues of so-called sphinxes, mostly recumbent rams or ram-headed lions, were erected at Thebes from temple to temple. An unfinished colossal sphinx of that age still remains in the Gebel Silsila quarries. The Egyptian sphinx was deemed to represent a real creature fabled to haunt the deserts. Sometimes it is hawk-headed or jackal-headed; winged and female forms are rare. According to Greek mythology the

sphinx propounded riddles, strangling those who failed to solve them, but slaying herself when Oedipus offered the solution.

The pair of bronze sphinxes at the base of Cleopatra's Needle on the Thames Embankment, London, are modern work, by G. Vulliamy. See Egypt; Hittites; Karnak; Pyramids.

Sphygmograph (Gr. *sphymos*, pulsation; *graphein*, to write). Instrument by which the beating of the pulse is recorded on a strip of paper. The characteristics exhibited by the tracing afford valuable information to the physician.

Spica, OR ALPHA VIRGINIS. Principal star in the constellation of the Virgin. It is of the first magnitude, an eclipsing and spectroscopic double star. The two components of the double appear to revolve about their common centre in four days at a speed of more than 80 m. a sec. Each component is about 700 times as bright as the sun.

Spice Islands. Historic name for the group of spice-yielding islands in Indonesia, now known as the Moluccas (*q.v.*).

Spices (Old Fr. *espice*, from Lat. *species*). Productions of plants that are aromatic to the smell and pungent to the taste. The spices are collected from different parts of plants. The most used are allspice, the berries of the pimento; cinnamon, the bark of a small evergreen tree of Ceylon; clove, the dried calyx and flower buds of a myrtle; ginger, the root of a tropical plant, and nutmeg, the kernel of another; mace is the covering of nutmeg. Ground spices are used as flavourings. Consult In Quest of Spices, S. E. Howe, 1944.



Sphinx of Gizeh, from the east. This gigantic figure, hewn from the living rock, is of unknown age and lay for centuries half buried in the sand

Spider. Well-defined order (Araneida) of the class Arachnida, which also includes scorpions, mites, harvestmen, etc. The class belongs to the large series of Arthropods (jointed-footed animals), but differs from the others in having no antennae.

The spider's body is divided into two parts: (1) The head and thorax, fused into one piece (the cephalothorax), and (2) the abdomen, usually all of one piece, and only rarely with hints of segmentation. Between these two parts there is typically a narrow waist. The region corresponding to the head bears two pairs of mouth parts: (a) a pair of two-jointed poison-jaws or chelicerae, and (b) a pair of sensitive, usually six-jointed pedipalps.

All spiders are poisonous, but the bite is not severe except in a few tropical forms. The poison of the bird-catching spider (*Mylgale*) kills a bird in a few minutes.

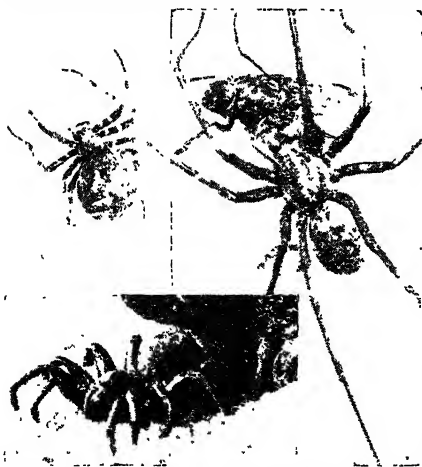
In male spiders the tip of the pedipalp is complicated; it becomes a reservoir for spermatozoa at the pairing season, and is used to transfer them into the female, where they fertilise the eggs just before these are laid. In the main, the pedipalps are touch-organs, and tactile sensitiveness is carried to perfection in the spiders.

On the top of the head are several pairs of simple short-sighted eyes. From the region corresponding to the thorax there arise four pairs of seven-jointed legs, ending in minute curved claws, by means

of which spiders grip the surface on which they creep. At the end of the abdomen there are 4-6 minute appendages transformed into spinnerets, from which the silken threads emerge. Each spinneret resembles the rose of a watering-can, for it bears numerous minute tubes (spinning-spools) through which the silk issues. There may be hundreds of these spinning-spools, and each is connected with an internal gland which makes the silk. The gland is enclosed in a muscular envelope, the contraction of which, acting like a syringe, forces the liquid silk down a duct and out at a spinning-spool. There are sometimes three kinds of glands, producing different kinds of silk, and it rests with the spider to use more or fewer at one time, thus adjusting the thickness of the thread. The thread is a fusion of many jets of liquid silk, which solidifies instantaneously on exposure to air.

A small minority of spiders (the bird-catching spiders, trapdoor spiders, etc.) breathe by two pairs of lung-books; all the rest breathe by two lung-books and two or four groups of air-tubes or tracheae like those of insects. Through an external slit, flush with the skin, air enters the compartments of the lung-book; in the partitions between the compartments the blood circulates and is purified. As to the other organs of the body, there is a muscular region near the beginning of the food-canal, for spiders suck the juices of the insects on which they mainly depend; there is a heart along the mid-dorsal line of the abdomen; there are digestive glands and structures analogous to kidneys.

What comes out of the hatched egg of a spider is practically a



Spider. 1. Full-grown garden spider. 2. South American trapdoor spider, at the mouth of its burrow. 3. House spider, devouring a bluebottle

miniature of the adult. In other words, there is no metamorphosis. The young spiders grow quickly and moult frequently. Spiders are characteristically terrestrial, but a few occur in fresh water, notably the water spider (*Argyroseta aquatica*), which makes a web under water and fills it with air.

When a spider is in danger of losing its foothold, it pays out a drag-line of silk. This is the origin of the irregular snare as in the house spider (*Tegenaria domestica*), and of the beautifully regular web, and the silk is also used by the females to make a cocoon for the eggs, and by some small spiders to form gossamer parachutes on which they are borne by the wind.

The males are usually smaller, often much smaller, than the females, and may be brighter in colour. Spiders are preyed upon by birds, lizards, wasps, and other enemies. See Animal colour plate; Arachnida; Bird-Catching Spider.

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Spider Monkey (*Ateles*). Genus of American monkeys. They are notable for their attenuated limbs, slender bodies, and long prehensile tails. Marvellously agile, they swing from bough to bough,



Spider Monkey. The black-faced species

making use of their prehensile tails. There is a large number of species, all found between Mexico and Uruguay, and in Brazil the natives use them for food.

Spiderwort (*Tradescantia*). Genus of perennial herbs of the family Commelinaceae, natives of America. They vary considerably in form and habit. The three sepals are sometimes coloured other than green; the three petals are equal, oval, blue, purple, rose, or white. Some tropical species are in cultivation in hot-houses and green-houses; but the best known is the hardy Virginian spiderwort (*T. virginiana*) of southern N. America,



Spiderwort. Leaves, buds, and flowers of the Virginian species

which has narrow leaves with purple veins, woolly sepals, and rich purple-blue petals.

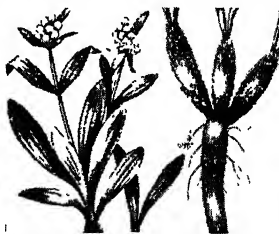
Spiegel or **SPIEGEL IRON** (Ger. *Spiegeleisen*). White cast iron used in the manufacture of steel by the Bessemer process. It contains 15 to 30 p.c. of manganese and about 5 p.c. of carbon and is added to control the amounts of these elements present in the finished steel.

Spike. Form of inflorescence in which the flowers are all stalkless, and attached to a common elongated axis. See Inflorescence; Sabadilla.

Spike Island. Small island of co. Cork, Eire. It lies in Cork Harbour, and on it during 1847-85 was the principal Irish convict prison. Many prisoners were employed in the construction of the royal dockyard and fortifications.

Spikenard (*Nardostachys jatamansi*). Perennial herb of the family Valerianaceae, native of the Himalayas.

Sometimes called nard, it has a short, thick, spindle-shaped rootstock, very fragrant, which constituted the spikenard of the ancients. The lance-shaped or spoon-shaped leaves are tufted, and the small, rosy-purple flowers are gathered into dense heads.



Spikenard. Left, leaves and flower heads; right, rootstock

Spilite. Type of basaltic rock which is rich in soda. Spilites are commonly associated with sediments laid down in elongated subsiding troughs (geosynclines), and because of their eruption beneath the sea, they commonly show pillow structure. See Igneous Rocks; Pillow Lava.

Spilsbury, SIR BERNARD HENRY (1877-1947). British pathologist. Educated at University College school, Manchester grammar

school, and Magdalen College, Oxford, he received his medical training at S. Mary's Hospital. After doing research work on bacteriology, he turned to the study of morbid anatomy and concentrated on forensic medicine. Scotland Yard called in his aid in connexion with many murder cases, one of the earliest being that of Crippen. Knighted in 1923, he was honorary pathologist to the Home office for many years until his death by his own hand, Dec. 17, 1947.



Sir Bernard Spilsbury, British pathologist

Spilsby. Market town of Lindsey, Lincs, England. It is 17 m. N. of Boston and 12 m. W. by N. of Skegness. The chief buildings are a 14th century church with monuments of the family of the earl of Ancaster, and the grammar school. In the market place is a statue of Sir John Franklin, who was born here. There is a trade in agricultural produce. Pop. 1,372.

Spin. Condition obtaining in aeronautics when an aircraft engine stalls, so reducing flying speed. The aircraft goes out of control and the nose drops, causing the machine to fall earthwards nose first and rotating about its longitudinal axis. There are three kinds of spin: (a) normal, in which the rotation of the aircraft may be clockwise or anti-clockwise with the nose pointing downward and describing a small circle, and the tail a larger one; (b) flat spin, in which the aircraft after spinning about eight rotations, begins to flatten out, its fore and aft axis becoming more horizontal; (c) inverted spin, in which the aircraft spirals upside

down, in a combination of looping, rolling, and yawing. In any kind of spin, the fall seldom exceeds 70 m.p.h., and if the spin starts at sufficient height there is usually time for the pilot to straighten out by centralising the rudder.

In ballistics spin is the rotation of a projectile in flight. According to the turn of the rifling, spin is to right or to left. The rate of spin decreases during the projectile's passage to the target, starting at 10 p.c. for the first second of flight.



Spilsby, Lincolnshire. Parish church of St. James. See previous page

Spinach (*Spinacia oleracea*). Annual herb of the family Chenopodiaceae. This native of the Oriental region was introduced to Great Britain in 1568. The seed should be soaked in water for at least twelve hours, and then sown thinly, at desired intervals from Feb. onwards, in moist, deep soil, where the plants are to remain. As the leaves of the spring-sown plants are ready to be picked in from six weeks to two months after sowing, spinach is a good catch crop. Sulphate or nitrate of soda, or sulphate of ammonia, may be applied to the surface of the soil when the plants are about three inches in height. Spinach is one of the most easily grown and profitable vegetables. *Pron.* spinn-idge.

Spinado. Card game, a variation of Newmarket. The holder of the ace of diamonds, when he has the lead, may use it as a stop to any sequence when he calls "spin." He may then start another sequence of his own, and so be able to play a card corresponding to one of those in the lay-out, which is the object of the game, as it entitles him to all stakes upon that card. In other respects the game is played like Newmarket.

Spinal Column. In vertebrate animals, a series of hollow, connected bones enclosing the spinal cord, and supporting the trunk. In the human species the spine or "backbone" is composed of 24 separate bones or vertebrae. During the development of the skeleton there are 33 vertebrae, but of these five unite into one mass, forming the sacrum, and below the sacrum are four very small vertebrae, which become more or less united as age advances, forming the coccyx. The separate vertebrae are connected with each other by cartilaginous disks.

The spine is not a straight column, but is curved forwards in the cervi-

cal and lumbar regions, and backwards in the dorsal and sacral regions. The ligaments and cartilages which unite the vertebrae permit of movements which are limited between any two vertebrae, but, extended over the column as a whole, permit of a considerable degree of rotation of the body and bending laterally or backward or forwards.

DISEASES OF THE SPINE. Curvature of the spine is most frequently due to rickets in childhood, or bad habits during adolescence when the child is growing rapidly, such as continuous stooping, which may result from sitting at too low a desk at school. Besides rickets and weakness during growth in adolescence, curvature of the spine may follow disease or dislocation of the hip-joint or disease of the knee-joint, which causes shortening of the leg or disease affecting the bones of the spine.



Spinach. Leaves and flowers of the table vegetable; inset, the two forms of leaf

The treatment of curvature of the spine in children consists, in the first place, of correcting all errors of position, and providing suitable desks and chairs. Appropriate gymnastic exercises and massage are helpful. The general health must be maintained, and any condition such as anaemia corrected. In severe cases spinal supports may be employed, but these have the effect of weakening the muscles of the back from disuse, and should be employed as little as possible.

Tuberculous disease of the spine, spinal caries, Pott's disease, or angular curvature, is an affection occurring at any age, but most frequently in children under the age of 10. The anterior surface of one or more of the vertebrae becomes attacked and eroded, with the result that the bodies of the vertebrae fall together, and a sharp angle is developed in the back. The symptoms of caries of the spine are pain, rigidity when certain movements are attempted,

and deformity of the back. In some cases the spinal cord becomes involved and paralysis may follow. As regards treatment, the essential feature is to immobilise the affected vertebrae, and relieve them of the weight of the body. This may be effected by keeping the child in the recumbent posture, placing it in a special apparatus, known as a Phelps box, or by applying a plaster jacket from the pelvis to the chin and neck, portions being cut out where a support is not needed. These measures as a rule have to be continued for six months or a year or more. During that time the general health should be carefully attended to, and the child should be as much as possible in the open air. Disease of the spine may also be the result of syphilis or rheumatism.

The spine serves two functions. It provides a firm though not absolutely rigid pillar, which enables the body to be maintained in the upright position, and the arches attached to the vertebrae form a continuous canal, in which the spinal cord is lodged and thereby protected from injury. Its average length is 28 ins. in the male, and 27 ins. in the female. Above, it supports the skull, and on the sides it supports the ribs. Below it rests on the sacrum, which forms part of the pelvic girdle.

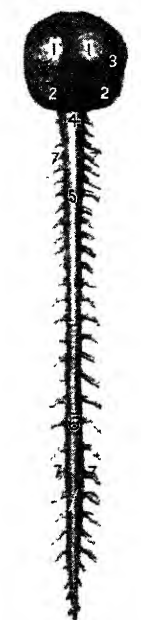
Spinal Cord. Column of nerve fibres and cells, continuous above with the brain, which extends from the lower border of the foramen magnum or large aperture in the base of the skull to the lower border of the first lumbar vertebra, where it terminates in a slender filament. It occupies the canal of the spine or backbone, and is surrounded by prolongations of the membranes covering the brain, namely the dura mater, arachnoid, and pia mater.

A section of the cord shows that it is composed of white matter and grey matter. The white matter, which is situated externally, consists of nerve fibres mainly running



Spinal Column and skull

lengthwise through the cord, and connected by a supporting material. The grey matter consists of nerve fibres, most of which are very fine, nerve cells, and a delicate supporting network. Thirty-one pairs of nerves are given off from the spinal cord, each nerve being formed from an anterior and posterior root which unite and pass out between the bony arches of the vertebrae. The spinal cord consists of many different strands of nerve fibres, and in the grey matter are nerve centres which take part in the discharge of various physiological functions. Through these strands of nerve fibres impulses are conveyed from the skin and other parts to the brain or spinal nerve centres, and through other strands go impulses to the peripheral muscles. Disease or injury of the spinal cord often leads to paralysis. See Disseminated Sclerosis; Locomotor Ataxia; Myelitis; Paralysis.



Spinal Cord and Brain. 1 and 2. Dura mater. 3. Meningeal arteries. 4. Superior swelling. 5. Middle swelling. 6. Inferior swelling. 7. Spinal nerves.

peripheral muscles. Disease or injury of the spinal cord often leads to paralysis. See Disseminated Sclerosis; Locomotor Ataxia; Myelitis; Paralysis.

Spindle Tree (*Euonymus europaeus*). Small tree of the family Celastraceae, native of Europe,



Spindle Tree. Fruits dried and split, revealing the orange seeds

W. Siberia, and N. Africa. It grows to a height of about 20 ft. only, and has smooth grey bark and four-angled twigs. The opposite, lance-shaped leaves have obscurely toothed edges, and the minute flowers are greenish white. The fruits are four-lobed capsules of crimson hue, which open to disclose the orange jackets (arils) of the few large seeds. The hard,

tough wood is of use for making small articles. See Celastraceae.

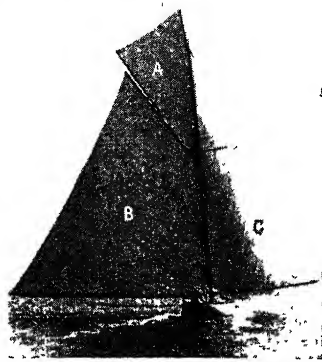
Spine. Backbone of an animal. Its full name is the Spinal Column (*q.v.*).

Spine. In botany, a sharp process borne by plants for defensive purposes. Distinct from a thorn in that it possesses no vascular tissue, it is most frequently found on the margins of leaves, as in the thistle and holly, but occasionally whole leaves are modified into spines, *e.g.* the cactus. The word is also applied to the protective outgrowths on the backs of hedgehogs and porcupines. See Hair; Thorn.

Spinel. Group of minerals having the formula $XO.Y_2O_3$ (when X = magnesium, divalent iron, zinc, and manganese; Y = aluminium, trivalent iron, and chromium). There are many species, the most important being spinel, $MgO.Al_2O_3$; hercynite, $FeO.Al_2O_3$; gahnite, $ZnO.Al_2O_3$; magnetite, $FeO.Fe_2O_3$; franklinite, $(Fe, Zn, Mn).O.(Fe, Mn)_2O_3$; chromite, $FeO.Cr_2O_3$. All spinels are characterised by isometric symmetry, octahedral form, and similar atomic structure. Colour varies considerably from black magnetite and chromite through green gahnite to clear varieties used as gemstones, namely spinel ruby, balas ruby, and rubicelle. The Black Prince's ruby in the British imperial crown is a spinel. Spinels are common accessories in igneous and metamorphic rocks, and in residual deposits. Gem varieties come from Ceylon, Burma, Siam, and Afghanistan.

Spinnet (It. *spinetta*, little thorn). Keyboard instrument of the harpsichord type, but smaller. Its strings were plucked by quills, whence probably the name, though there is some evidence that this commemorates an Italian maker, Spinetti (*fl.* c. 1500). The spinnet varied in compass from under four to just five octaves. Early examples were small enough to be placed upon a table when in use, but later and larger specimens stood on legs. It was a favourite household instrument in the 16th–18th centuries, the cases being frequently embellished with paintings and occasionally with precious stones. See Virginal.

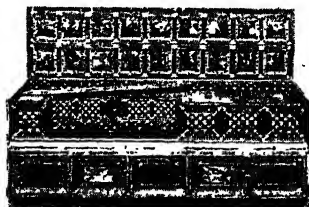
Spinnaker (A.S.). Sail set out from the weather side of a vessel and opposite the mainsail. It is used largely in racing yachts. The spar which takes it at the foot is called the spinnaker boom. Mostly the spinnaker is set when the vessel is running before the



Spinnaker. Stern view of a racing cutter showing her sails. A. Topsail. B. Mainsail. C. Spinnaker

wind. A spinnaker topsail is a topsail set on a jack yard or short boom. See Ship.

Spinning. Art of drawing, twisting, and combining animal or vegetable fibres into continuous threads. The simplest method of hand-spinning is with the rock or distaff, a system of most use in treating comparatively long fibre, like flax or worsted. The dressed or combed material, fashioned into a twist by hand, is fastened to the spindle. The spindle is given motion by a quick rub against the thigh with the right hand, and is suspended by the thread, thus acting as a bob or weight for twisting the cord of fibres, the thread being meanwhile elongated between the hands.



Spinnet. A 16th cent. example of this keyboard instrument

The spinning wheel, in an early form, consisted of a stool bearing a large and heavy wheel and a support to carry the spindle, which was belt-driven from the fly-wheel. The spinster maintained the motion of the wheel by strokes of the right hand, and with the left stretched the cord of roving or prepared fibre, first twisting the cord and then winding it on the spindle. The improved or Saxon wheel was fitted with a treadle to drive the fly-wheel, and the spindle was fitted with a flyer, a leg of metal pivoted on top of the spindle and moving round its circumference. At the foot of the

flyer was an eye through which the thread could be led, and the bobbin around the spindle was dragged round by its motion. Thus both hands of the spinster were liberated and, the flyer supplying the necessary drag, the twisting of the cord and the winding-on of the yarn continued simultaneously.

The spinning wheel formed the basis of Hargreaves's jenny (*v.i.*), which was at first an apparatus for enabling one person to spin sixteen or more threads at once. Lewis Paul of Birmingham in 1738 invented the means of superseding human fingers in drawing the sliver, or roving, out finer. He passed the rope of prepared material through pairs of rollers, each pair running faster than the preceding ones, so that the sliver was delivered at a faster rate than it was fed, and this principle of roller drawing, or drafting, is the fundamental one in making disconnected fibres into a continuous yarn. In Arkwright's machine, 1769, known as the water-frame, Paul's invention was first brought into successful use.

Cap and Ring Systems

The flyer system of continuous spinning, although giving technically perfect results, is subject to the one grave disadvantage that the vibration set up by the revolution of the flyer-leg limits the speed at which a spinning frame can be driven, and therefore the output. Other means have hence been sought of securing the light drag upon the cord that will enable twisting and winding to go on simultaneously. The cap system has been introduced for the less hairy wools; the stationary projecting cap on top of the quickly rotating spindle creates enough friction for the purpose without too much disturbance of the fibre.

The ring system is employed chiefly for cotton, and especially to make single warp yarn. In this system the spindle revolves at high speeds (5,000-10,000 r.p.m.) within rings or annular openings made in a steel rail or shelf. The rail is given an up-and-down motion which guides the yarn in winding-on. Its rings project above the surface of the rail and are made with high accuracy. Over the lip of the ring a light bent wire called the traveller is hooked, and the yarn passes under the wire which travels around the ring, exerting light friction upon the thread.

Upon any of these continuous spinning machines the cord of rovings prepared in the preliminary processes is drawn from large

bobbins through pairs of front and back rollers, which draft or reduce the roving in accordance with the gearing. The amount of twist imparted is settled by the ratio of the speed of the spindles, and, as twisting impedes the process of winding-on, more twist than necessary is not given. Spinning frame minders supervise two or three sides of frames, which are set back to back and carry some 200 or more spindles each, and the minder has the task of rejoining broken threads and preventing the production of waste.

The finest cotton and some wool yarns are spun on the mule, a machine which performs the operations of drawing-out, twisting, and winding on to a bobbin successively, instead of simultaneously. Some linen yarns are "wet-spun," i.e. the roving is passed through a bath of hot water as it is being drawn out, and the result is a yarn with fibres cemented together. *See* Arkwright, Sir R.; Blanket; Bobbins; Cotton; Distaff; Loom; Mule; Silk; Weaving; Yarn.

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Spinning Jenny. Machine for spinning invented by James Hargreaves, of Blackburn. It utilised the same principles as are embodied in the modern machinery. The jenny was turned by hand and spun few threads at a time; it was improved on by Arkwright and Crompton, and is now obsolete. This was one of the machines that inaugurated the industrial revolution. *See* Hargreaves, J.

Spinola, Ambrosio, Marquis de los Balbasses (1569-1630). Spanish soldier. Of Genoese birth,



Ambrosio Spinola,
Spanish soldier

he entered the Spanish service in 1602, seized Ostend in 1603, and in 1604 became commander-in-chief in Flanders, conducting a campaign which, though successful from a military point of view, ruined him financially. The capture of Breda, 1625, his greatest exploit, closed his military career. Sent to Italy in 1629, he died Sept. 25, 1630.

Spinoza, Baruch, or Benedict de (1632-77). Dutch philosopher. Born at Amsterdam, Nov.



Baruch Spinoza,
Dutch philosopher

24, 1632, of Portuguese-Jewish parentage, he at first studied theology, but his unorthodox views brought the hostility of the rabbis and led in 1656 to his

excommunication. An attempt having been made on his life by one of his co-religionists, Spinoza left Amsterdam, and devoted himself to philosophy. He refused a professorship at Heidelberg lest it might interfere with his studies and obtained a living by polishing lenses. From 1663 he lived at The Hague until he died, Feb. 21, 1677. His character commands the greatest admiration, for he was not only persecuted but suffered from consumption and existed in dire poverty. He bore all with fortitude and dignity, and his integrity allowed no compromise.

Spinoza's philosophy is based upon that of Descartes, but set forth according to a rigorously geometrical method. An idea of it can be gained from his own words at the beginning of his most important work, the *Ethics*. It is the most perfect form of pantheism. Starting from the definition of substance as that which is in itself and is conceived by itself, he shows that there is only one substance—God, the absolutely infinite, with infinite attributes, of which we know only two, thought and extension.

Each of these attributes carries with it an infinity of modes; the totality of these modes is the world. By attribute is meant that which constitutes the essence of substance; by mode, that which is in something else by which also it is conceived. The human soul is only the idea of the human body. The ideas composing it are adequate or inadequate; if the former, it is free and active; if the latter, a slave and passive. True freedom depends upon the extent to which man identifies himself with God by contemplation. *See* *Ethics*; *Metaphysics*; *Pantheism*; *Philosophy*.

Bibliography. Works, Eng. trans. R. H. Elwes, 2 vols., 1883-84; *Life and Philosophy*, F. Pollock, 1899; *Life*, J. Caird, 1901; *Philosophy*, R. McKeon, 1928; *Correspondence*, ed. A. Wolf, 1928; *Spinoza*, R. Kavser, 1947.

Spion Kop, BATTLE OF. Defeat of the British army in the S. African War. Under Buller's plan to relieve Ladysmith by turning the right of the Boer position on the Tugela, Warren crossed at Trichardt's Drift, 5 m. farther up, and essayed a flanking movement.

Warren duly effected his crossing, and on Jan. 22, 1900, decided to attack Spion Kop, an eminence which formed the centre of the Boer right. On the night of Jan. 23-24 the position was captured by the brigade under Woodgate, with whom was associated Thorneycroft in command of mounted infantry. Daybreak showed that the position was very badly exposed. Woodgate was mortally wounded, and the command devolved on Thorneycroft, under whom the position was stubbornly held all day. At nightfall Thorneycroft, regarding the situation as hopeless, decided upon a retreat.

Meanwhile, help was being arranged, and the Boers, discouraged by their failure to regain the summit, had withdrawn their guns from the neighbouring heights. The news, however, reached Thorneycroft too late, and when on the 25th a Boer "forlorn hope" advanced against the summit they found it occupied only by nearly 300 British dead. See South African War.

Spiraea. Large genus of perennial herbs and shrubs of the family Rosaceae, natives of the N. temperate and cold regions. The British species are dropwort and meadow sweet. The name is also used by florists for *Astilbe japonica*. See Meadow Sweet.

Spiral (Lat. *spira*, coil). Curve which runs continuously about a fixed centre with constantly increasing radius vector. The chief spirals are the Archimedean spiral, the radius of which increases uniformly with the angle; the hyperbolic spiral, in which the radius vector is inversely proportional to the angle; and the logarithmic spiral, or spiral of growth as it is sometimes called, the spiral common in nature, e.g. in spiral shells, the angle of which is proportional to the logarithm of the radius vector.

Spire (A.S. *spīr*, a spike or stalk). Acutely pointed structure surmounting a building. The origin of the spire was the steep pyramidal roof characteristic of the secular buildings in France and Germany during the 10th and 11th centuries; when this type of roof was transferred to churches its extension into spire form was begun.

The church of Thaon, Normandy, possessed a rough pyramidal roof dating from the late 11th century, and this has been regarded by



Spion Kop. British troops advancing to the capture of the hill occupied by Boer forces, in the early morning of Jan. 24, 1900

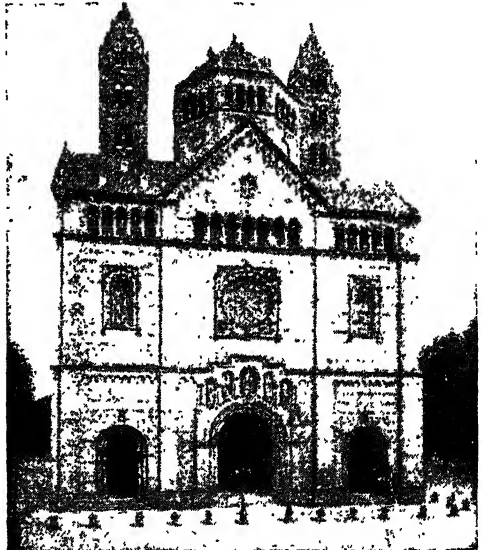
From a drawing by R. Caton Woodville

authorities as the starting point of the spire, and Normandy, especially the Caen neighbourhood, as the scene of its early development.

In England, during the Early English Period (q.v.), when the height of the church towers was greatly increased, spires were raised from the summits, their base being concealed by battlemented parapets and pinnacles. The form of the spire was generally, as in Normandy, octagonal. In this type the spire was a separate structure from the tower, an addition that served merely to finish off the latter; the idea of so blending tower and spire by

means of pinnacles, crotchets, and spire lights as to make one composition of the two, without any assertive line of demarcation between them, was developed on the Continent at a later date. Among the notable spires of Great Britain those of Salisbury and S. Mary's Cathedral, Edinburgh, are respectively highest in England and Scotland. See Autun; Cathedral; Clermont - Ferrand; Norwich; Rouen; Salisbury, etc.

Spires, SPEYER OR **SPIER.** City of Rhineland - Palatinate, W. Germany. It stands on the left bank of the Rhine,



Spies, W. Germany. The Kaiser Halle or vestibule, added to the west end of the Romanesque cathedral, 1854-58

During the Second Great War U.S. 3rd army forces captured Spire, March 23, 1945, against little opposition, German resistance W. of the Rhine having disintegrated. The city came into the French zone of occupation in 1945. Estimated population, 25,000.

Spirit. In theology, the life-giving principle. In accordance with a primitive conception, the word in many languages means the breath (e.g. Heb. *ruach*, Gr. *pneuma*, Lat. *spiritus*, *anima*). God is spirit (John 4, v. 24), but beliefs differ as to the relation of other spirits to God, some regarding them as from their creation eternally distinct, others as emanations from the universal Spirit, into which they will be reabsorbed. The N.T. recognizes impure or evil spirits.

In philosophy, as well as in ordinary speech, the term spirit is commonly equivalent to soul, and is used to denote immaterial, non-extended substance, which feels, wills, and thinks. See Mind; Psychology; Soul.

Spirit of Salt. This chemical preparation is described under Salt, Spirit of.

Spirits. General term for alcoholic liquors above a certain strength. Such liquors include not only those used as drinks, e.g. whisky, brandy, gin, etc., but also those used for lighting, power, and other purposes, e.g. methylated spirit. The word is also used in

chemistry for various solutions, e.g. spirit of hartshorn, a solution of ammonia in water. See Alcohol; Brandy; Distilling; Whisky.

Spiritual. A religious folk song of American negroes. The strong rhythmic quality of spirituals is generally attributed to the negro's African descent, while their subjects point to the Christian teaching he has received since his arrival in N. America. They are mostly on Biblical themes, which are imaginatively treated to make a powerful emotional appeal. Developed in camp meetings on Southern plantations, they are notable for their blend of plaintive melancholy and simple faith; and by their emphasis on the hope of heaven they helped the negro to bear with patience the hardships of slavery.

Spirituals first became widely known in 1871, when a choir of emancipated slaves, calling themselves the Jubilee Singers, left Tennessee on a tour to raise \$20,000 for the funds of their struggling Fisk university. After singing their spirituals in many American cities, they visited England, where they had a sensational success, sang before Queen Victoria, and breakfasted with Gladstone. Their university profited by \$100,000 from this tour. Spirituals gained a vogue on the concert stage in the repertory of professional artists, not altogether to the liking of some negro leaders.

agency), levitation, psychic lights and breezes, materialisations, and psychic photography. Other phenomena, such as raps, table-turning (typology), and direct voice, are physical in operation but mental in content. Physical phenomena occur chiefly at dark séances and their history is clouded with fraud and suspicion; but they have, none the less, been produced under very severe test conditions.

The Basis of Spiritualism

The case for spirit communication rests more upon the evidence of mental phenomena, or rather upon the interpretation of such evidence. The evidence for supernormal acquisition or transmission by a medium of information relating to a deceased person or to circumstances of his life on earth is virtually unchallenged by students of psychical research: such information—often unknown to the sitter, and, more rarely, unknown to any living person, yet verifiable—transmitted by the surviving personality through the medium is the basis of spiritualism. Psychical research, which has been investigating the phenomena for more than 60 years, allows that after eliminating fraud, mal-observation, self-delusion, etc., there are phenomena which have a supernormal (not supernatural) origin; but it offers hypotheses other than that of spirit communication. Some eminent scientific investigators, however, have accepted the spirit hypothesis, notably Sir William Crookes, Sir William Barrett, Alfred Russel Wallace, and Sir Oliver Lodge.

Spiritualism is, to a great extent, organized as a religious community, with churches large and small where services of a simple nonconformist type are held, including a demonstration of mediumship. As a religion spiritualism has no clearly definable doctrine, but expresses itself in a vague theism, with sometimes a leaning towards pantheism. It claims to be a religion based upon facts, but the relation between this theism and the alleged facts of spirit communication is obscure. A large number of spiritualists—though probably a minority—deny that spiritualism is a religion in itself, and insist that its claims can be accepted without loss of loyalty to one's existing faith. Among these are many Christian ministers. Religious spiritualism in the U.K. is represented by two major organizations of affiliated churches, the Spiritualists' National Union and the Greater World

SPIRITUALISM AND ITS CLAIMS

H. J. D. Murton, Editor of *Light*

In this article the editor of a well-known Spiritualist periodical tells the history and explains the central beliefs of Spiritualists. See Home, D. D.; Medium; Planchette; Psychical Research; Survival; Telepathy

In the widest sense of the term Spiritualism means any system of thought opposed to materialism. It is, however, generally used in reference to the belief that, in certain conditions, it is possible for communication to take place between the living and the dead. What are called psychic phenomena have occurred all down the ages, and the Bible is rich in incidents and manifestations which can, it is claimed, be interpreted as being of a similar nature to phenomena occurring today. Spiritualism, however, is regarded by its adherents as having originated in 1848 at Hydesville, in the state of New York, U.S.A., when certain rappings, occurring in the home of the Fox family, were traced, it is alleged, to a discarnate source, a code being arranged by which the purporting communicator could

answer questions and spell out messages by the raps. The three Fox sisters became practising mediums, and the movement spread rapidly through the U.S.A.

In 1852 American mediums visited England, but met with little success until the arrival of D. D. Home. The movement spread to the Continent, and in France, under the influence of alleged spirit teachings received by Allen Kardec, it adopted reincarnation as one of its beliefs; a belief held by a large and possibly growing number of English spiritualists.

The phenomena of spiritualism are divided into two classes, mental and physical. Mental phenomena include clairvoyance, clairaudience, trance utterances, and automatic writing. The physical phenomena are telekinesis (movement of objects without known

Christian Spiritualist League. The other kind of spiritualism is represented by independent societies such as the London Spiritualist Alliance, with its organ *Light*.

Generally speaking, the Church is hostile towards spiritualism, the R.C. Church uncompromisingly so. In 1938 Dr. Lang, then archbishop of Canterbury, received a report from a committee he had appointed about four years earlier, of prominent clergymen and laymen, to inquire into spiritualism. This report, which represented the majority view of the committee, the archbishop declined to publish, but it was subsequently published by a spiritualist weekly newspaper, *Psychic News*. It stated that, while the strictly scientific verdict on the matter of personal survival was not proven, certain psychic experiences made a *prima facie* case for survival, and when every possible explanation of alleged spirit communications has been given and all doubtful evidence set aside, it was probable that the hypothesis that they proceed in some cases from discarnate spirits was the true one.

While there is undoubtedly a strong non-Christian, and to some extent anti-Christian, element in spiritualism, it is claimed that the evidence for human survival endorses a basic article of Christian faith. On the other hand, spiritualists often assert that survival is thus shown to be a natural, not a supernatural, fact; a biological rather than a religious matter. They argue, however, that knowledge of a life beyond death is an essential factor in the full understanding of man's purpose in life and of the moral obligations involved. The signatories of the majority report mentioned allow that if spiritualism contains a truth, it fills up certain gaps in human knowledge, but they also issue a warning that "it is not legitimate, and it is unquestionably dangerous, to allow an interest in spiritualism, at a low level of spiritual value, to replace that deeper religion which rests fundamentally upon the right relation of the soul to God Himself."

The general position, stated without bias, seems to be that evidence pointing to spirit communication undoubtedly exists. It is not strictly scientific, but more in the nature of "legal" evidence upon which the verdict must be a matter of personal judgement. To spiritualists the verdict is proven; to non-spiritualists it is either non-proven or no case.

Bibliography. *Man's Survival After Death*, C. L. Tweedale, 1909; *Facts of Psychic Science and Philosophy*, A. Campbell Holms, 1925; *Life Beyond Death with Evidence*, C. Drayton Thomas, 1928; *On the Edge of the Etheric*, J. A. Findlay, 1931; *Encyclopedia of Psychic Science*, Nandor Fodor, 1934; *Discarnate Influence in Human Life*, E. Bozzano, 1938; *Evidence of Personal Survival from Cross-correspondences*, H. F. Saltmarsh, 1938; *Case Book for Survival*, A. T. Baird, 1948; publications of The London Spiritualist Alliance, and the periodicals *Light*; *The Two Worlds*; *Psychic News*; *Psychic Times*; *The Greater World*.

Spiritualities (Lat. *spiritualia*). Ecclesiastical term for the power bestowed upon a bishop at his consecration and confirmation, and for the ecclesiastical revenue arising from other sources than land. The temporalities consist of the endowment of a see. See Ecclesiastical Law.

Spirit-Worship. Ritual homage offered to incorporeal beings or powers conceived as dwelling in visible objects or in the invisible world. In its stricter sense the term denotes the veneration of, or appeal through offering and prayer to, friendly agencies below the rank of deities. In common usage it embraces also the propitiation of evil spirits or hostile demons under the impulse of fear. See Ancestor-worship; Animism; Demonology; Fetishism; Mana.

Spit. Long narrow bank of sand or shingle connected at one end to the shore. Spits often continue the general trend of the shore line, though they may grow out across the inner part of an inlet. By continuation of growth a spit may develop into a bar across the mouth of a bay, and so impound a lagoon, which will gradually silt up. Spits grow according to the supply of material transported along the shore by wave action; but at the free end the material is carried past the line of the spit and deposited behind it. This leads to the development of a hooked spit. See Coast.

Spitalfields. Dist. of E. London. In the met. bor. of Stepney (*q.v.*), it lies between Whitechapel and Mile End New Town, E., and the City and Shoreditch, W. Christ Church, by Hawksmoor, opened 1728, and several times restored, is notable for its arched portico and clock tower, and has an outdoor pulpit.

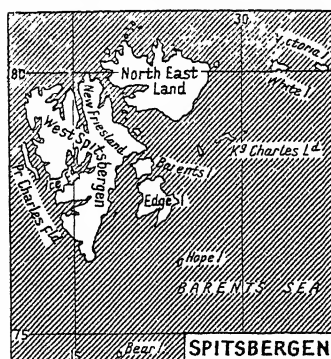
In Roman times a burial ground, and once known as Lolesworth,

Spitalfields was named later after fields adjoining the priory and hospital of S. Mary Spital, founded 1197. The silk industry was established here by French Huguenot refugees in 1685 and flourished for a century or more. Spitalfields Market for fruit and vegetables dates from the 17th century. In 1928 a new market was built by the corporation at a cost of £2,000,000; it covers six acres, has a mile and a half of warehouses and stands, and an open auction sale-room.

Spitfire. British fighter aircraft. Designed by R. J. Mitchell (*q.v.*), and built by Vickers-Armstrong Supermarine works, the Spitfire was based on the seaplanes which won the Schneider Trophy (*q.v.*) in 1927, 1929, and 1931. The first military version flew in 1936, and delivery to squadrons of the R.A.F. began in 1938. At the outbreak of the Second Great War the Spitfire and Hurricane (*q.v.*) equipped almost all the home defence fighter squadrons and played an outstanding part in the battle of Britain. When the Allies assumed the offensive in N. Africa, Burma, and Europe, the Spitfire was adapted to a variety of rôles: all-altitudes fighter; escort; fighter-bomber; photographic reconnaissance craft; and naval fighter (Seafire). Originally powered by a 1,030 h.p. Rolls-Royce "Merlin" engine giving a max. speed of 342 m.p.h., the Spitfire progressively advanced in speed to the 450 m.p.h. of the Mark 24, powered by a 2,035 h.p. Griffon engine, introduced in 1946. Armament increased in hitting power from the eight Browning .303 machine-guns in 1938 to four 20 mm. cannon in 1946. The standard wing span was 36 ft. 10 ins., but there were several variations in wing design. During the war Spitfire funds were opened to help provide the aircraft for the R.A.F. and found generous response. After the war the Spitfire was gradually withdrawn from the first line. A later development, the Spitfire (with naval version, Seafang) never went into service. See Aeroplane illus. p. 129; Britain. Battle of.

Spithead. Roadstead off the S. coast of England. It extends for 12 m. N.W. to S.E., between East Cowes and Portsmouth, has an average breadth of 4 m., and communicates with the Solent and Southampton Water on the W. See Portsmouth.

Spitsbergen OR SVALBARD. Arctic archipelago. Lying 360 m.



Spitsbergen. Map of the Arctic archipelago lying to the north of the Norwegian coast

N. of Norway, which annexed it in 1925, and extending from lat. $76^{\circ} 25' N.$ to $80^{\circ} 50' N.$, and from long. $10^{\circ} 30' E.$ to $36^{\circ} E.$, it consists of the mainland or West Spitsbergen; North East Land, King Karl Land, Barents, Edge, and Hope Islands on the E.; Prince Charles Foreland on the W.; and many smaller islands. Bear Island, 130 m. S.S.E. of Spitsbergen, is generally included in the archipelago. The total land area of the group is about 24,294 sq. m.

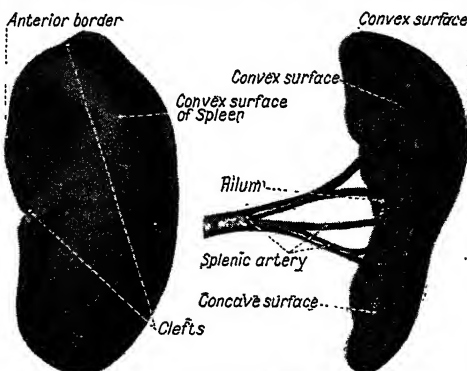
The whole country is mountainous, rising to peaks of about 3,000 ft., exceeding 5,000 ft. in the N.E. The main island is deeply dissected on the W. and N. by long branching fjords which give deep water access to the heart of the country. Of these Ice Fjord, 56 m. long, is the most important. Good natural harbours are numerous.

The country is heavily glaciated, but with the exception of North East Land, which is practically covered by an ice-cap, and New Friesland in the N.E. of the mainland, there is no inland ice in the sense in which the term is used of Greenland and Antarctica. The ice takes the form of long, much crevassed glaciers each confined to its own valley; most glaciers reach the sea. The winter is severe, but July to Sept. give temperatures well above freezing.

Vegetation is scanty, but there are patches of luxuriant tundra in places. Bird life is abundant in summer. Land animals include the reindeer, fox, and polar bears. Various whales and seals occur. Since its discovery by the Dutch in 1596, Spitsbergen has been the resort of whalers, trappers, and hunters. Since about 1900 the minerals found have included coal, copper, and asbestos.

A treaty signed in Paris, Feb. 9, 1920, placed Spitsbergen under Norwegian sovereignty, and on Aug. 14, 1925, that country formally took possession of the archipelago. During the Second Great War a raid was made in 1941 by Canadian, British, and Norwegian forces to forestall a German plan to seize the rich coal mines on Spitsbergen. The Allies brought the 700 miners and their families to Great Britain and destroyed the mines. British and German meteorologists collected data in the fjords until the Germans were forced to leave. On Sept. 8, 1943, German naval forces, including the warships Tirpitz and Scharnhorst, made an attack on the archipelago. In 1947 the U.S.S.R. approached Norway regarding military bases on Spitsbergen, and the Norwegian garrison was withdrawn.

Spitteler, CARL (1845-1924). Swiss poet and philosopher, born April 24, 1845, at Liestal. After



Spleen. Front and side view of the abdominal organ

studying law and theology, he taught in Russian and Finnish families during 1871-79, while preparing his first great work, Prometheus and Epimetheus, a parable. Published under the pseudonym C. F. Tandem, 1881, it remained long unnoticed, while Spitteler returned to Switzerland. He published poetry, allegory, essays, a 4-vol. poetic work, Olympian Spring (1900-06), and a novel Imago (1906). Another Prometheus volume followed in 1924. Sometimes compared to Nietzsche in his sorrowing but defiant attitude to life, Spitteler was fundamentally a healthy personality whose idealism gained strong influence over the German-speaking world. Among many honours he received the Nobel prize for literature, 1919. He died in Lucerne, Dec. 29, 1924.

Splay (abbrev. of display). In building and joinery, a surface making an oblique angle with another surface. The jambs of windows are splayed in order to admit more light. The term is applicable to surfaces larger than a chamfer (*q.v.*) or bevel.

Spleen. Organ of oblong, flattened form placed in the upper part of the abdomen on the left side. It is about 6 ins. long, 3 ins. broad, and weighs from 6 to 8 ounces. The spleen is the largest of the ductless glands. Its functions are (1) to form white blood corpuscles and, in certain animals, red corpuscles; (2) to disintegrate some of the red blood corpuscles which have discharged their function and are worn out; (3) to take part in nitrogenous metabolism by the formation of uric acid.

DISEASES OF THE SPLEEN. Enlargement of the spleen is a symptom of many diseases, including malaria, leucocythemia, Hodgkin's disease; it may also occur in congenital syphilis and rickets. Splenomegaly, or splenic anaemia, or Banti's disease, is a disorder in which enlargement of the spleen is associated with increasing anaemia. Haemorrhage is often a serious symptom. The disease is chronic and may last 10 or 12 years. Removal of the spleen has been followed by cure, but the operation is serious, and should be undertaken only in severe cases.

Spleenwort (*Ceterach officinarum*). Fern of the family Polypodiaceae. It is a native of Europe, W. Asia, and N. and S. Africa: common in many parts of Britain.

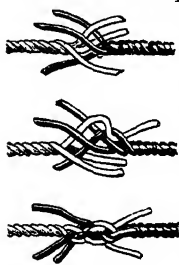


Spleenwort. Scaly spleenwort. *Ceterach officinarum*, that grows on rocks and masonry

The fronds grow in a tuft from rocks and masonry, each being narrow-lance-shaped, the two sides cut into semi-elliptic lobes. They are of leathery consistency, the upper side green and smooth, the underside shaggy with long chaffy scales, which are silvery on the young frond, red-brown on the mature. The fern curls up and looks withered in dry weather, but expands again in moisture. Its other names are rusty-back, scale-fern, finger-fern, and milt-waste.

The ceterach is the plant referred to as spleenwort in all the old herbals and medico-botanical works; but in modern times spleenwort has been adopted as a popular name for all the ferns of the extensive genus *Asplenium*, of which there are about 300 species, nine of them natives of the U.K. These include the wall rue (*A. ruta-muraria*), maidenhair spleenwort (*A. trichomanes*), black spleenwort (*A. adiantum-nigrum*), and sea spleenwort (*A. marinum*). All grow naturally in rock crevices, but several take possession of decaying masonry, a trait which indicates their special suitability for cultivation in the rock garden, where they should be given a rather elevated and well drained position. See Fern.

Splice. Term used for the joining together of two ends of rope. It is done by untwisting their strands for a short distance and threading the strands of each rope under and over those of the other in such a manner that a joint is formed by the friction of the strands on one another. Where it is desired to avoid increasing the thickness of the rope at the joint,



the loose ends of the strands are cut to varying lengths and thinned down to points. The strands of one rope are then twisted into the vacant spaces in the other rope,



Splice. Stages in making common forms of splice. Top, short splice, joining two rope ends; below, eye splice, for making a loop



Split, Yugoslavia. The quayside of this seaport on the Dalmatian coast

and the tapered ends threaded as above described.

The term also means to unite two pieces of wood by tapering the ends so that they overlap, gluing them together, and sometimes binding them. In another form of splice, one end is tapered centrally and fits into a corresponding tapered recess in the other piece. These forms of splice are used for golf clubs, cricket bats, and other implements of sport. In carpentry and engineering, a method of joining the ends of two pieces of timber or metal by means of side strips or plates bolted or riveted to the main pieces is known as splicing. See Ship.

Splint. Artificial support for limbs when the bones are broken, or weakened or bent by disease. Splints may be made of wood, leather, zinc, poroplastic material, etc., and are of numerous forms, sizes, and shapes, according to the condition of the limb or the purpose to be achieved. Splints of poroplastic or leather have the advantage that they can be softened and moulded to the form of the limb. See First Aid.

Splint. Bony enlargement on the shank bone of a horse. It is extremely common, more frequently in the fore than the hind legs, and on the inside rather than the outside. Slight cases give little trouble, but lameness may be caused in young horses.

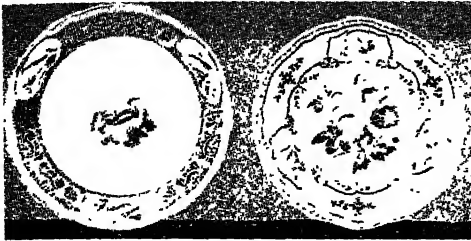
Split. Seaport and town of Yugoslavia, in Dalmatia. Known to the ancients as Aspalathos, and to Italians today as Spalato, it stands on a peninsula on the Adriatic Sea, picturesquely encircled by hills, 74 m. S.E. of Zara (Zadar), and is a rly. terminus. The dominating building is Diocletian's palace, put up when that emperor founded the town in 303. His mausoleum was transformed

into a cathedral, '650, dedicated to the Virgin, and has reliefs on the portal depicting scenes in the life of Christ. Wine, oil, wheat, figs, and leather are the principal products of Split, which has also fisheries. Upon the surrender of Yugoslavia to Germany in 1941, the town was garrisoned by Italians. These became disaffected and in Sept., 1943, combined with Marshal Tito's partisan forces to hold the port for a fortnight against German bombing attacks. Patriots finally liberated it, after three days' fighting, on Oct. 29, 1944. Pop. 43,711.

Split Infinitive. The infinitive form of a verb in English involves the use of the word *to*. Thus, *to state* is an infinitive; to interpose an adverb thus, *to openly state*, is to split the infinitive. This practice is reprehended by grammarians and most stylists, the accepted form being *to state openly*, or *openly to state*. To split an infinitive is preferable, however, if avoiding it would cause ambiguity.

Splügen. Alpine pass between Switzerland and Italy. Its height is 6,945 ft. There is a carriage road between Chiavenna and Coire (Chur), connecting the valley of the farther or hinter Rhine with that of Lake Como. The road over the pass was constructed by the Austrian government, 1819-21, and has three galleries as a protection against avalanches on the Italian side. A French army crossed the pass in 1800.

Spode. Variety of chinaware. In 1770 Josiah Spode began to make feldspar porcelain at Stoke-upon-Trent. He introduced crushed bone into its composition, which was a soft paste, giving a very transparent body. Spode's shapes were good, and his pieces rather highly decorated with flowers and gilding. He was succeeded by his



Spode Porcelain. Plates of the delicate decorated chinaware made by Josiah Spode
Herbert Allen Collection, Victoria and Albert Museum

son, and the firm became one of the leading houses in the trade. See Pottery.

Spodumene (Gr. *spoldos*, ashes). In mineralogy, a lithium and aluminium silicate. It has a grey, green, yellow, or purple glassy lustre and is found in granite pegmatites. The biggest deposits of this important ore mineral are in Dakota, U.S.A. Two varieties, hiddenite and kunzite, in colour respectively emerald green and lilac, are out as gemstones.

Spofforth, FREDERICK ROBERT (1853-1926). Anglo-Australian cricketer. Born at Balmain, Sydney, Sept. 9,



F. R. Spofforth,
Anglo-Australian
cricketer

1853, he played for New South Wales and Victoria, and on settling in England qualified for Derbyshire. He was a member of the first Australian team to come to England in

1878, and during the tour took 352 wickets. His most remarkable performance was capturing 11 wickets for 20 runs against a strong M.C.C. eleven. In 1884, his greatest season with the ball, he took 218 wickets in first-class cricket for an average of 12.53 runs. In test matches he captured 94 wickets for 1,731 runs, and performed the hat-trick in the match at Melbourne in 1879. Perhaps the greatest who ever lived, the "demon bowler" died June 4, 1926.

Spohr, LOUIS OR LUDWIG (1784-1859). German composer. Born at Brunswick,

April 5, 1784, he showed precocious musical talent and entered the court orchestra at Brunswick in 1798. An able violinist, he wrote



Louis Spohr,
German composer

of the earlier Romantic school, Spohr wrote some 200 works, including eleven operas, several oratorios, notably *The Last Judgment*, 1826, nine symphonies, and chamber music. His violin concertos are perhaps his most memorable works, and he had great influence in developing the technique of that instrument. His violin course, still a standard work, was published in 1831, and his autobiography, 1860, Eng. trans. 1865.

Spokane. City of Washington, U.S.A., the co. seat of Spokane co. It stands on the river of the same

his first violin concerto in 1802. He toured extensively in Germany, visited England in 1820, conducting Philharmonic Society concerts with success, and was court conductor at Cassel during 1822-57. He died there on Oct. 22, 1859. A leading composer

of foundry and machine-shop products, bricks, furniture, flour, pottery, and brooms. The celebrated Spokane Fall is within the city, and generates water power. Just outside is Fort Wright, an army post. The pop., which trebled between 1900 and 1910, is 122,001.

Spoleto. City of Italy, in the prov. of Perugia. It occupies the centre of an agricultural dist., and crowns a hill about 1,470 ft. in elevation, 88 m. by rly. and 61 m. direct N.N.E. of Rome. Lucrezia Borgia was imprisoned in 1499 in the citadel which dominates the town. A Roman bridge and aqueduct spans the ravine between the main height and Monte Luco; many other Roman remains exist. The 11th century cathedral of S. Maria Assunta has a later Renaissance portico; several churches occupy the sites of Roman temples. That of S. Salvatore was partly unroofed in the Second Great War. The chief occupations are gathering truffles, meat preserving, and the manufacture of olive oil and silk. The ancient Umbrian town, Spoletum, became Roman in 241

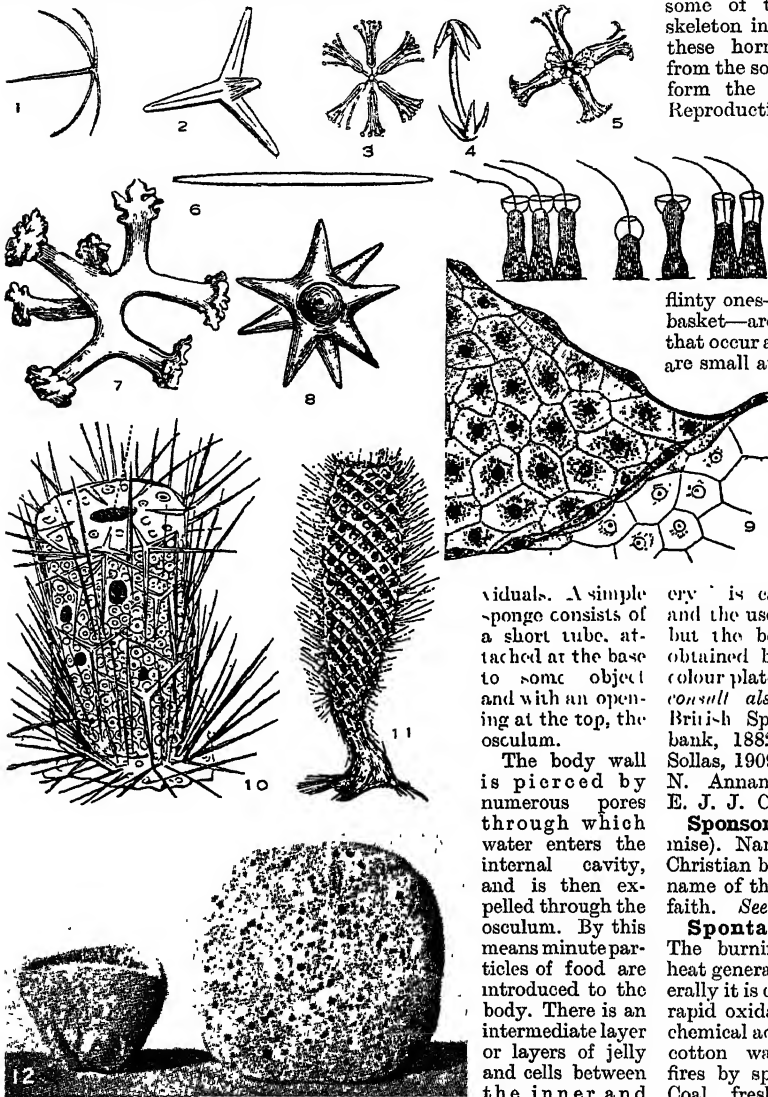


Spoleto, Italy. The hilltop citadel that dominates the city, and the Roman bridge and aqueduct

name, 340 m. by rly. E. of Seattle. It is the seat of Gonzaga and Spokane universities, and Whitworth and Spokane colleges. From 1810 a Canadian fur trading outpost, with the discovery of gold in the neighbourhood it was transformed into a teeming town in the 1870s. The city charter dates from 1881. There are valuable lumber interests, and in the surrounding districts gold, silver, copper, and other minerals are mined. Other occupations include wheat and fruit growing, and the manu-

b.c., was destroyed by the Goths, rebuilt by Narses, and became the capital of the Lombard duchy of Spoleto. It was a Papal possession from 1220 to 1860.

Spoleto, ALMONTE, DUKE OF (b. 1900). Italian nobleman. Son of the duke of Aosta, he was a cousin of ex-King Victor Emmanuel III. He was proclaimed King Tomislav of Croatia, 1941, after the German conquest of Yugoslavia, but never assumed the throne and renounced it in 1943. He succeeded his brother as 3rd duke of Aosta, 1942.



Sponge. 1-8. Spicules: 1, 6-ray type, with distal ray suppressed; 2, 4-ray; 3 and 5, 6-ray, with secondary rays; 4, bow-shaped, with modified ends; 6, needle-shaped; 7, irregular rays, with branched ends; 8, star-shaped. 9. Ectoderm and, top, endodermic cells, magnified 500 times. 10. Calcareous sponge, with well-defined spicules. 11. Venus flower-basket. 12. Turkey sponge, and (right) hard sponge

Spondee. In prosody, a foot containing two long, or accented, syllables. The word is derived from the Gr. *spondē*, a libation, because this slow, dignified measure was much used in the hymns sung at solemn libations.

Sponge. Name given generally to the lowly animals of the subkingdom Parazoa, phylum Porifera. Most of them occur in stocks or colonies, but some are simple indi-

viduals. A simple sponge consists of a short tube, attached at the base to some object and with an opening at the top, the osculum. The body wall is pierced by numerous pores through which water enters the internal cavity, and is then expelled through the osculum. By this means minute particles of food are introduced to the body. There is an intermediate layer or layers of jelly and cells between the inner and outer integuments, called the endoderm and the ectoderm. There are no internal organs, but part of the body cavity

is lined with specialised cells, called choanocytes (funnel-vases), which catch and absorb the minute organisms on which the animal feeds. Other cells are specialised for the reproductive functions; and still others secrete the minute flinty or calcareous spicules which strengthen the body wall and form a loose skeleton.

The majority of sponges are branched and complicated; and

some of them secrete a horny skeleton instead of spicules. It is these horny skeletons, cleansed from the soft animal matter, which form the sponges of commerce. Reproduction in the sponges takes place very variously. Fission, budding, and sexual propagation all occur in different species.

Sponges assume the most varied forms, and many of the flinty ones—e.g. the Venus flower-basket—are very beautiful. Those that occur around the British coasts are small and inconspicuous; but in the tropical and sub-tropical seas they grow to a great size. Of the horny sponges, the Turkey cup sponges are of the finest texture and are in great demand for toilet purposes.

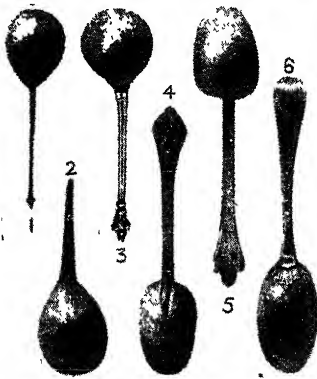
The sponge "fishery" is carried on by trawling and the use of long pronged forks; but the best species are always obtained by diving. See Animal, colour plate; Crab; Germination; consult also Monograph of the British Spongidae, J. S. Bowerbank, 1882; Porifera, I. B. J. Sollas, 1909; Freshwater Sponges, N. Annandale, 1911; Sponges, E. J. J. Creswell, 1921.

Sponsor (Lat. *spondere*, to promise). Name given to one who, at Christian baptism, promises, in the name of the baptized, to keep the faith. See Baptism; Godfather.

Spontaneous Combustion. The burning of a substance by heat generated within itself. Generally it is due to heat developed by rapid oxidation, a form of violent chemical action. Oil distributed on cotton waste frequently causes fires by spontaneous combustion. Coal, freshly mined, sometimes burns spontaneously, the cause being the oxidation of the paraffin hydrocarbons on exposure to air.

The now discredited theory that spontaneous combustion is possible in human beings of marked alcoholic tendencies has been employed in fiction. An instance is the fate of old Krook in Dickens's *Bleak House*. See Pyrophorus.

Spontaneous Generation. The doctrine which puts forward a view that living matter can come into existence from non-living material. In the absence of any satisfactory evidence in its favour, the doctrine is rejected by most modern biologists. See Abiogenesis; Biology; Life.



Spoon. 1. Pewter, 15th-16th century. 2. Horn, 16th-17th cent. 3 and 5. Latten, tinned, 17th cent. 4. Pewter, 17th cent. 6. Pewter, 18th cent. Guildhall Museum, London

Spoon (A.S. *spon*, a chip of wood). Implement consisting of a small bowl with a handle, used primarily for conveying liquid or soft food to the mouth. The ancient Egyptians made spoons of ivory, flint, etc. Greek and Roman spoons were of metal, the handle often ending in a point for extracting snails from their shells.

In England the cheaper metals, such as pewter, began to supersede wood and horn as the material of spoons towards the close of the Middle Ages, but silver spoons were long a rarity. The form and decoration varied until the latter part of the 18th century, when the style approximated to that now in use. See Apostle Spoon.

Spoonbill (*Platalea leucorodia*). Bird, related to the ibis, and distinguished by its long flat beak, which widens out at the tip somewhat like a spoon. It is about 32 ins. long, and has white plumage with a tinge of buff on the neck. The beak is black with the exception of the tip, which is yellow. The legs are long, and the general form of the bird is suggestive of a heron. It is common throughout central and S. Asia and Europe, and formerly bred in Great Britain, where it now occurs as a visitor to Norfolk. It is always found near water, usually in marshes, and feeds upon small molluscs, crustaceans, frogs, and fish.

Spooner, WILLIAM ARCHIBALD (1844-1930). An English scholar. Born July 22, 1844, he was educated at Oswestry and New College, Oxford. Ordained in 1872, he became chaplain to Archbishop Tait in 1878, and was warden of New College, 1903-1924. His works included an annotated edition of Tacitus, 1891; Life of Bishop

Butler, 1901; Memoir of William of Wykeham, 1909. He died Aug. 29, 1930. See Spoonerism.

Spooner, WINIFRED (1900-33). English airwoman. In 1928 she was the first woman to compete in the king's cup air race round Great Britain, and led as far as Newcastle, but finished third. In 1930, making an attempt with a companion on the England-to-Cape record, she crashed in the Tyrrhenian Sea and swam two miles to land. That year she was acclaimed world champion woman aviator and awarded a trophy by the international league of aviators. She died of influenza, Jan. 13, 1933.

Spoonerism. Confused expression of an amusing nature. The term is derived from the habit of Dr. W. A. Spooner (*q.v.*) of accidentally interchanging sounds, usually the initial ones, in words in close association. A genuine spoonerism was, "I believe you are occupewing my pie" for "I believe you are occupying my pew."

Sporades (Gr. *sporadikos*, scattered). Name of a group of islands in the Aegean Sea, since 1948 part of the kingdom of Greece. They are alternatively known as the Dodecanese, and are so described in this Encyclopedia. The N. Sporades are another group lying off Euboea, the largest island being Seyrus (*q.v.*), and others Skiatho, Skopelo, Cheliodromia, and Pelago. All are rocky and wooded. Sponge fishing is the chief occupation of the inhabitants.

Spore (Gr. *sporos*, seed). Reproductive cell of plants. Reproduction by spores is one of the most prominent means of plant growth, and may be asexual or sexual. The spores of many plants, *e.g.* fungi, are light and easily carried through the air by the wind, while others are so constructed as to cling to passing animals, etc. Most consist of a hard outer and a

delicate inner wall, and receive names according to their type, *e.g.* the basidiospores of toadstools, and vary considerably in their external structure. Sexual spores are the result of the fusion of two sexual cells or gametes. Zygospores are the result of the union of similar gametes, and oöspores the union of dissimilar gametes. See Cell; Meniscium; Moss; Oleandra; Pillwort; Pteris; Seed.

Sporozoa (Gr. *sporos*, seed; *zōon*, animal). Parasitic protozoa. So called from reproducing by means of spores, sporozoa form important and widespread organisms, and include malaria germs, Texas cattle-fever germs, tsetse disease, etc. Living by absorption of the fluid juices of the tissues of their host, sporozoa develop from spores which break up into small bodies or sporozoites, and before their life cycle is complete they must leave their original host for a second host.

Thus the sporozoites of malaria are developed in mosquitoes and are then transferred to man. Usually the two hosts are one vertebrate and the other an invertebrate. Nearly all sporozoa are microscopic, and the methods of destroying them are prevention of their transference from one host to another, or killing the original host. Mosquito nets provide an example of the first method, and the proper drainage of stagnant pools and destruction of the breeding-grounds of the insect exemplify the second. See Malaria; Parasite.

Sporran (Gael., purse). Purse or pouch of leather worn in front of the kilt by Scottish Highlanders. It is usually made of fur. See Highlands.

Sporting Gun. Term in general use to define a firearm which discharges small shot for killing small game. All modern sporting guns are breech loading and employ central fire cartridges. See Gun.

Sporting Times, THE. London weekly newspaper which appeared from 1865 to 1932. Dr. Shorthouse and John Corlett started it, the latter being proprietor and editor, 1874-1912. The "Pink 'Un," named from the tint of its paper, specialised in horse racing and the music hall, and also invented the term Ashes (*q.v.*) in connexion with Anglo-Australian cricket.

Spotted Fever. Popular name for the infectious disease cerebrospinal fever (*q.v.*).

Spottiswoode. Scottish family. It is traced back to a Robert Spottiswoode who held a barony of this name in Berwickshire in the time of



Spoonbill. Flat-beaked marsh bird, related to the ibis

Alexander III (1241-86). A cadet was lieutenant-governor of the colony of Virginia. In 1819 Andrew and Robert Spottiswoode succeeded their uncle, Andrew Strahan (d. 1831), in the management of the London printing business founded by Charles Eyre and William Strahan (1715-85) and a share in the king's patent.

The death of his brother in 1832 left Andrew in sole control of the business. He resigned his share in the royal patent to his elder son, William (1825-83), who thus became partner in the firm of Eyre and Spottiswoode. William, a distinguished mathematician and physicist, was P.R.S. from 1878 until his death, June 27, 1883.

Sprain OR **Strain**. Tearing or stretching of the synovial membrane of a joint or of ligaments, resulting from sudden violence applied to the joint. Inflammatory effusion, swelling, and pain follow. Immediately after the accident, the joint should be supported with a firm, wet bandage, and the limb kept quiet and raised. An evaporating lotion should be applied to the bandage from time to time. Gentle movements of the joint should be made after the acute symptoms have subsided, followed, as the swelling decreases, by massage and exercises of the joint. *See* First Aid; Massage.



Sprat. Small variety of herring caught off the British coasts

Sprat (*Clupea sprattus*). Small European fish of the herring family, common in British seas. It varies in length from 3 to 5 ins. when adult, the young figuring largely as whitebait. Its chief distinction from the herring, apart from its small size, lies in the absence of teeth from the vomerine bone. Sprats occur in brackish water about river estuaries; but spawning takes place at sea. The fishery is of importance in the late autumn, seines, drift nets, and stow nets being used.

Spree. River of Germany. It rises in Saxony near the border of Czecho-Slovakia, and flows generally N.W. to join the Havel at Spandau, after a course of 226 m. The lower course has been deepened to allow large vessels to reach Berlin. Canal connexions provide access to the Oder and navigation to Stettin.

Sprengel Pump. Pump for obtaining high vacua. Invented

by the German chemist H. J. P. Sprengel, it consists essentially of a vertical capillary glass tube, its upper end communicating with a funnel by means of an indiarubber tube which can be compressed as required. Below the indiarubber connexion is a lateral branch of the glass tube to the vessel in which a vacuum is desired. The lower end of the tube is bent and dips into a trough. The funnel is filled with mercury, which is allowed to drip past the lateral connexion, and in doing so traps a portion of the air from the vessel and carries it down the tube. The continued application of the method finally exhausts the air from the vessel. *See* Pump.

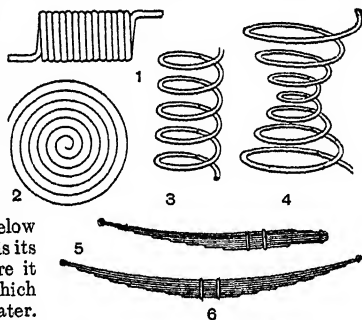
Spring. First season of the year. In the N. hemisphere it is reckoned astronomically from the vernal equinox (about March 21) to the summer solstice (about June 21). In the S. hemisphere it corresponds in date with the N. autumn. *See* Seasons.

Spring. Natural outflow of underground water. When rain falls, some of it remains in pools upon the surface and is quickly evaporated, some runs off the surface to join a rivulet or stream, some sinks into the soil and is used by plants, whilst if the rock below the soil is permeable, some finds its way to a greater depth, where it reaches the surface below which the rocks are saturated with water. The top of this saturated zone is termed the water table.

The level of the water table varies with the kind of rock, rainfall, and topography. Where valleys cut down to the water table, water will flow out on the surface of the land and valley-springs are formed (*see* Diagram 1, V-Sp). In wet weather the water table rises, and if it then reaches the level of a valley floor a seasonal spring or bourne is produced (*see* Diagram 2, b). Stratum-springs result from the underlying of a porous bed by an impervious one, and the junction of the two outcropping on a hillside. The lower impervious bed checks the normal downward pas-

sage of water, and the flow is deflected along the junction surface to escape at the lowest point (*see* Diagram 3, S-Sp). Springs often occur also along faults (Diagram 4, F-Sp), which are planes of shattering in the earth's crust. Such springs are a type of artesian spring which results from underground water in a porous horizon managing to break or force a passage upwards by pressure through overlying impervious strata. Hot springs are found either in areas of recent volcanic activity or where water is rising to the surface from considerable depths in the crust. *See* Fault; Well-sinking.

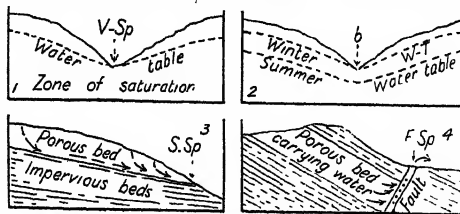
Spring. Elastic body of metal, rubber, wood, or enclosed fluid, to exert, resist, or store up force. The most common forms of metal springs are here illustrated. The spiral spring is used chiefly for



Spring. Principal types of mechanical spring. 1. Torsional. 2. Spiral. 3. Helical. 4. Double spiral. 5. Cantilever (laminated). 6. Semi-elliptic (laminated).

clockwork, and is subjected to bending. Helical compression and tension springs are designed to resist compression and extension in the direction of their axes. The primary stresses in the material are torsional. The stiffness of both these types varies as the fourth power of the diameter of the wire, other things being equal. They may also be used to transmit force circumferentially, *e.g.* the springs of a mouse-trap.

The laminated spring is that most generally employed for vehicles of all kinds. It is composed of a number of steel plates bound together at the centre or at one end, but free to slide over one another at other points. The length of the



Spring. Diagrams showing types of natural springs. 1. Valley spring. 2. Bourne. 3. Stratum spring. 4. Fault spring.

plates increases regularly to give the spring the shape of a triangle, or two triangles set base to base. The plates are curved, so that they will be straightened by the greatest load they are called upon to carry. It is important that all the plates should be of the same width and thickness. The elasticity of a spring varies inversely as the cube of the thickness, other factors being equal.

Buffer springs for rly. rolling-stock may be large disks of rubber, 2 ins. thick, separated by metal plates.

Air under compression is the most perfect form of spring, as it is infinitely elastic and has no limit of strength.

Spring, HOWARD (b. 1889). British novelist. Born in Cardiff Feb. 10, 1889, one of a family of nine, he lost his father when he was eleven. Leaving school at 12 to start work as a messenger boy, he later became a reporter on the South Wales Daily News, which he left in



Howard Spring,
British novelist

1911 to join the Yorkshire Observer. At the outbreak of the First Great War he was on the staff of the Manchester Guardian, to which he returned after serving in the Intelligence branch, G.H.Q., France. His life in Manchester clearly had great influence on him, as he made it the scene of several novels. In 1931 he joined the London Evening Standard, of which he became book critic. His first story, Darkie and Co., 1932, was written for his children, and after two novels, The Shabby Tiger, 1935, and Rachel Rosing, 1936, he wrote two more children's books, Sampson's Circus and Tumbledown Dick, 1936. O Absalom (repub. as My Son, My Son), which appeared in 1938, was translated into most European languages. Like his Fame Is the Spur, which followed, 1940, it was filmed. Of his later books, Hard Facts, 1944; Dunkerleys, 1946; and There Is No Armour, 1948, are novels, while Heaven Lies About Us, 1939; In the Meantime, 1942; and Another Thing, 1946, are all autobiographical.

Springbok (*Gazella euchore*). Species of gazelle found in S. Africa. It stands about 30 ins. high, and has cinnamon-yellow hair with white under parts and a line of

white hair along the back. The horns are lyre-shaped and about 15 ins. long, and they are present in both sexes. The animal is noted for its high bounds when running.

The name Springboks has been popularly used for teams of S. African cricketers or Rugby football players in the U.K., also for S. African troops.

Springfield. City of Illinois, U.S.A., the state capital and the co. seat of Sangamon co. It is 186 m. S.W. of Chicago, and is served by the Illinois Central and other rlys. Manufactures include watches, lumber products, woollen goods, flour, engines, boilers, soap, and bricks. Farming and horse-breeding are important local industries. Some 20 coal mines are in the vicinity. In this city (incorporated 1832, becoming a city 1840) Abraham Lincoln practised law for the quarter-century preceding his presidency. He is buried in the crypt of the national monument erected to his memory in Oak Ridge cemetery. Pop. 71,864.

Springfield. City of Massachusetts, U.S.A., co. seat of Hampden co. It stands on the Connecticut river, 100 m. by rly. W. by S. of Boston, and is served by the Boston and Maine and other rlys. Educational institutions include the American International College and the Y.M.C.A. College. The park system covers 1,600 acres. Industries include the manufacture of electric cars, motor vehicles, cotton and woollen goods, electrical appliances, cigars and tobacco, machinery, and confectionery. Settled in 1636, Springfield was chartered as a city in 1852. Here John Brown, in 1847-49, organized a post to enable runaway slaves to flee to Canada. In 1927 the rising river flooded low-lying portions, causing property losses amounting to millions of dollars. Pop. 149,554.

Springfield. City of Missouri, U.S.A., the co. seat of Greene co. It is 225 m. by rly. W. by S. of St. Louis, in the Ozark Mts., and is served by the St. Louis and San Francisco rly. Native Missourians form 73 p.c. of the pop., and one-fifth of the workers are employed by the railroads, most of the rest by processing the output of farms lying within a 150-m. radius. Springfield was settled in 1830.



Springbok. South African
species of gazelle

incorporated in 1838, and became a city in 1881. Pop. 61,238.

Springfield. City of Ohio, U.S.A., the co. seat of Clark co. It stands on Mad river, at its confluence with Lagonda Creek, 44 m. W. of Columbus, and is served by the Cleveland, Cincinnati, Chicago and St. Louis, and other rlys. Witten-

berg College (Lutheran) is here. Motor truck manufacture and the printing of four national magazines are important industries. About five million rose plants are sent out annually from the city's many greenhouses. First settled in 1799, Springfield was incorporated in 1827, and became a city in 1850. Pop. 70,662.

Spring-gun. Mechanical arrangement in which a trip wire is fastened to the trigger of a gun or rifle in such a way that anyone pulling the wire discharges the gun. To set one in a way which may cause bodily harm is illegal. Spring-guns were formerly used to a considerable extent to prevent poaching on game preserves, and they are frequently employed in military defence work.

Springhill. Town of Canada, in Nova Scotia. It is 75 m. due N.N.W. of Halifax, and is the centre of a colliery dist. served by the Cumberland rly. and Coal Company rly. Pop. 7,170.

Springtail. Order (Collembola) of small wingless insects, which have

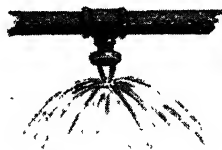


Springtail. Orchesella
cincta seen from above

a forked organ turned forwards under the abdomen. When this is suddenly released, it strikes the surface on which the insect is standing and so throws it up into the air. They are common under stones, herbage, etc.

Some of the species are aquatic; and one, *Anurida maritima*, is fairly common on the sea shore. See Insect.

Sprinkler. Fire-extinguishing device. Water piping is laid on from elevated tanks or a pressure



Sprinkler. Diagram showing screw-in attachment. Top, sprinkler in action. See text.

supply, and this branches out into over-head parallel pipes extending from end to end of a building or room, and spaced at convenient distances apart. In each line of piping a rose or sprinkler is inserted at intervals and sealed with a composition which readily fuses. If a fire breaks out the heat quickly melts this composition and water is then sprayed out. A local fire may thus be extinguished without all the sprinklers coming into action. Valves are provided in the pipes so that the water may be cut off when no longer needed. Sprinklers are usually provided at the rate of one to about every 70 sq. ft. of superficial area. See Fire Brigade.

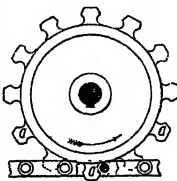
Sprinting. Short distance running. The sprint is regarded as one of the most strenuous of athletic events, as the utmost pace has to be maintained throughout the entire distance run. Although the most popular sprint distance is 100 yards, races of 60 yards, 75 yards, 120 yards, 220 yards, and even 440 yards are also classed as sprint races. The practice of short bursts of speed, from 30 to 40 yards, the maintenance of a long stride, and speed in getting off the mark are important factors in sprinting. The start should be made from a crouching position, with the hands lightly resting on the ground.

Not a few male sprinters have attained "evens," i.e. 100 yards in 10 secs. The world's amateur record for 100 yards is 9.3 secs., by M. E. Patton (U.S.A.), 1948. The women's record time is 10.7 secs., by M. Jackson (Australia), 1950. See Running.

Sprit Sail (A.S. *spréot*, pole). Sail which is extended by a sprit, or pole, reaching across the sail from the mast at the foot, to the peak. It can be raised, lowered, or brailled up very quickly. See Ship.

Sprocket. In machinery, a tooth or projection on the circumference

of a wheel. A sprocket wheel is one with cogs to engage with the links of a chain, as in the driving-wheel of an ordinary bicycle.



Sprocket wheel, with cogs a, a, a

Spruce (*Picea excelsa*). Evergreen tree of the family Coniferae. Native to Europe, it was introduced into Great Britain before 1548. It attains a maximum height of considerably over 100 ft., when planted in deep, rich loam. First planted in Great Britain as an ornamental tree, or behind young plantations of shrubs to act as



Spruce. Cones and scale-like leaves of the black spruce, *Picea nigra*

a nurse, the 20th century has seen considerable increase in govt. forestry plantations of spruce for its relatively quick yield of timber intended for use in aircraft construction. The timber is also useful for roofing, flooring, poles, and ladders, or for scaffold poles, masts, or pitprops. Black spruce (*P. nigra*), a small N. American fir, is largely used in the manufacture of paper pulp.

Spruce Beer. Alcoholic beverage. It is brewed from sugar or treacle and a decoction made from

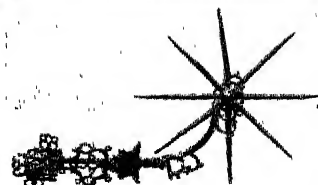
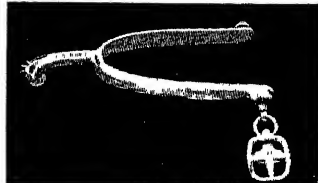


Spurge. Yellow flowers and bracts of the wood spurge; right, leaves

the young shoots of the spruce-fir, fermented with yeast, and variously flavoured. The black beer of Danzig is a well-known variety.

Sprue. Disease occurring in hot, damp climates, characterised by dyspepsia, diarrhoea, sore tongue, anæmia, and wasting. The cause is unknown, but the condition arises from defective absorption of many vital food factors, including fat, from the bowel. A diet with high protein and low fat content is given, with liver injections.

Spur (A.S. *spura*). Sharp instrument fitted to the heel of a rider, to press into the side of a horse to urge it on. Modern spurs usually have rowels or little wheels edged with sharp points. At one time gold spurs were a sign of knighthood. The word is also a contraction for spur wheel, which consists of a circular disk having around its periphery metal, leather, or other teeth for gearing with another wheel or a toothed rack. The teeth are parallel to the axis of the wheel as distinct from, e.g. helical wheels, in which the teeth form portions of helices.



Spur. Ornamented spur of the 16th century. Top, types employed in cavalry and hunting

Spurge (*Euphorbia*). Large genus of trees, shrubs, and herbs of the family Euphorbiaceae. They are natives of all except the extremely cold climates. Most of them have milky, acrid juice, and many are succulent like cacti. Few of them have conspicuous flowers, but in some species, *E. pulcherrima*, the Poinsettia of

gardeners, for instance, the yellow blossoms are surrounded by large bracts which are brilliantly coloured red. Some of the European species are mere weeds of cultivated ground, but the wood spurge (*E. amygdaloides*) is a shrub-like perennial with large persistent leaves. Cypress spurge (*E. cyparissias*), another European species, is grown in garden borders.

Spurgeon, CHARLES HADDON (1834-92). British preacher. Born at Kelvedon, Essex, June 19, 1834, the son of



C. H. Spurgeon,
British preacher

an Independent minister, after a little education he was for a time a schoolmaster at Newmarket. Having joined the Baptist denomination, he became, in 1852, minister of a Baptist chapel at Waterbeach, where his success won for him, at the age of twenty, an invitation to a church in Southwark. There his preaching attracted great crowds, and after Exeter Hall and the Surrey Gardens music hall had been used for the services, the Metropolitan Tabernacle was built for him, 1860-61. There he preached until his death at Mentone, Jan. 31, 1892.

Eccentric and sensational in his appeals, possessing a fund of humour and a remarkable power of homely speech, Spurgeon was the most popular preacher of his day. His creed was of the narrowest, a Calvinism of the most unyielding type; rather than tolerate any departure from his views, he withdrew from the Baptist Union in 1887. He was, nevertheless, a great student, especially familiar with the writings of the Puritans. His activities included the foundation of a college for training Baptist ministers, an orphanage at Stockwell, and some almshouses. His sermons, published regularly, had an enormous sale, and his magazine, *The Sword and Trowel*, was equally popular. His other writings include *The Treasury of David*, and *John Ploughman's Talk*. One of his sons, Thomas, was pastor of the Metropolitan Tabernacle, 1892-1908. *Consult* *Autobiography*, 1897-1900; *Personal Reminiscences*, W. Williams, 1895; *Lives*, W. Y. Fullerton, 1921; J. C. Carlile, 1933.

Spurn Head. Promontory on the E. coast of the East Riding of Yorkshire, England. It extends 2½ miles into the estuary of the Hum-

ber and has two lighthouses. In 1864 groynes had to be erected to prevent encroachment by the sea, but this remains a constant threat. *See* Ravenspur.

Spurrey (*Spergula*). Genus of plants of the family Caryophyllaceae, natives of temperate regions. One species, *S. arvensis*, the corn spurrey, grows in Great Britain. It has stalks 6 to 12 ins. long, swollen at the joints, and panicles of white flowers. It is frequently grown as a sheep fodder. Sandwort spurrey (*Spergularia rubra*) and sea spurrey (*S. salina*) are British plants of an allied genus. Both have pink flowers.

Spurs, BATTLE OF THE. Fought near Thérouanne, between the English and the French, Aug. 16, 1513. Henry VIII was besieging Thérouanne. To relieve the hunger of its garrison the French planned to threaten the English with 8,000 men, while a small column rushed in supplies. The English learned of the scheme, and when the French appeared they found themselves in the grip of two forces. After a brief cavalry skirmish the French knights spurred away. Hence the name given to the encounter, in which Bayard was taken prisoner. Six days later Thérouanne surrendered.

Sputum (Lat. *spuere*, to spit). Material coughed up from lungs or air passages. *See* Expectoration.

Spy (Old Fr. *espier*, to espy). One who obtains prohibited information surreptitiously. A spy may be a national of the country requiring the information, who spies for patriotic reasons, or one who reveals his own country's secrets to a foreign power either for monetary reward or to further some form of ideology. In the last case, the spy is more correctly a renegade or a "fifth columnist." In theatres of military operations, a spy is distinct from a scout; the latter seeks information while wearing uniform, while a spy assumes disguise. A captured spy is ignominiously put to death, a scout must be treated as a prisoner of war. The employment of spies in wartime is recognized by international law, but the spy himself is regarded as an outlaw. In time of peace spies are employed by governments to detect internal disaffection, as well as to ferret out secret information about armaments and inventions; while large industrial undertakings frequently use spies to discover processes used by their trade competitors. *See* Espionage; Official Secrets Acts; Secret Service.

Spy. Pseudonym adopted by Sir Leslie Ward (q.v.), British caricaturist.

Squad. Military term for a small party of men. The term is usually applied to recruits who are grouped in squads for purposes of drill and instruction before being allotted to their various units. The awkward squad consists of recruits who find difficulty in learning drill.

Squadron. Military term for a sub-division of a cavalry or armoured regiment. A British cavalry regiment is divided into three or more squadrons, corresponding to an infantry company. Each is commanded by a captain, or a major assisted by a captain, and is sub-divided into two troops, each commanded by a lieutenant. Royal Tank regiments have four squadrons to the battalion, and Royal Armoured Corps regiments, which are mechanised cavalry, four squadrons to the regiment.

In the Royal Navy a squadron is a number of warships, smaller than a fleet, commanded by a flag officer for a special service or station. Cruisers and battleships of a fleet are divided into squadrons for operational purposes, when four ships of one particular type constitute a squadron. Vessels below cruiser category are organized in flotillas.

In the R.A.F. a squadron varies between 9 and 12 aircraft according to type, divided into three or four flights. Four squadrons make up a wing. A field squadron of the R.A.F.'s Regiment consists of one armoured, one rifle, one support, and one headquarters flight, totaling 360 officers and men. An R.A.F. Regiment A.A. squadron consists of four flights, each manning four Bofors guns.

Squadron Leader. Title in the Royal Air Force of an officer of a rank equivalent to that of lieutenant-commander in the navy and major in the army. The insignia of rank are three rings on the sleeve and epaulettes.

Squall. Sudden blast of strong wind, lasting for some minutes, frequently with a temporary change in direction. The wind may attain a velocity of 50-100 m.p.h. These violent fluctuations should not be confused with the normal gustiness due to friction with the ground, etc., and to local obstructions.

Squalls occurring simultaneously along an advancing line, sometimes several hundreds of miles long, constitute a line squall. The phenomenon is caused by a relatively cold mass of air undercutting

and replacing a warmer one; it thus indicates the arrival of the cold front of a depression. Usually such a storm makes its appearance with ragged, threatening clouds associated with a long roll of low black cloud in the shape of an arch, and beyond this a uniform light grey sky. As the roll of cloud passes overhead, heavy rain squalls, often with hail, thunder, and a sudden drop in the temperature, are experienced at the surface. Line squalls may take 24 hrs. to die away, but their rates of advance can be predicted fairly accurately; they generally travel across the British Isles from W. to E. In the U.S.A. violent line squalls occur over the central plains. Other examples of these storms are the pampero of S. America and the southerly burster of Australia. In some regions, e.g. the S. shores of the Mediterranean, the warm air current, usually the source of the precipitation, is dry and the so-called white squalls are characterised by absence of cloud. *See* Depression; Gust; Wind.

Squarcione, FRANCESCO (1394-1474). Italian painter, founder of the Paduan school of painting. Born at Padua, where he also died, he began work as a tailor and embroiderer, and was more than 40 when he opened his academy for painters. Most of the work attributed to him was done by his pupils, among whom was his adopted son, Mantegna. *Pron.* Skwar-cho-nay.

Square. Four-sided plane rectilinear figure having all its sides equal and all its angles right angles. It is a particular case of the parallelogram, and its area is a^2 where a is the length of a side.

Square root in mathematics is a quantity or function such that when multiplied by itself it gives a specified quantity or function. Thus the square root of 25 is 5, of $a^2 + 2ab + b^2$ is $a + b$, etc.

Square Rig. Sails set crosswise of a ship, and thus the opposite of fore-and-aft rig, in which the sails are set fore and aft. Full-rigged ships are mostly square rigged, and the term is widely applied to craft that have only a proportion of square sails among their canyars. *See* Polacca; Ship.

Squares, METHOD OF LEAST. In statistics and mathematics, a method of deducing the most probable result of a series of observations in measurement in cases where the arithmetical mean of a number of observations of the same quantity is the most pro-

bable value of that quantity. The adoption of the mean value of the observation is the simplest case. When the observed values depend on several unknown quantities the rule is to adopt such values for the unknown quantities as to make the sum of the squares of the residual errors of the observations as small as possible.

Squaring the Circle. In mathematics, the problem which requires the finding by geometrical methods of a square whose area is equal to that of a given circle. The problem is as old as Pythagoras, and was one of the famous problems of the ancients. It has been definitely proved by Lindemann to be insoluble. *See* Quadrature.

Squash (*Cucurbita maxima*). Annual herb of the family Cucurbitaceae. Its native country is unknown, but it is cultivated in all



Squash. Leaves and edible gourd

warm and temperate lands. It is a trailing plant like the vegetable marrow (*C. pepo*) with large, rough, lobed leaves, and large, bell-shaped, yellow flowers. The fruits are fleshy and edible. *See* Gourd; Pumpkin.

Squash Rackets. Game played in a similar manner to ordinary rackets, but on a considerably smaller court, which confines the game to two persons. The ball is of indiarubber, the size of a five ball.

The walls of the court are either of smooth wood or of cement, and the game is much slower than rackets, the walls not having the same amount of spring and life as those of a full-size court. Squash is governed by most of the rules appertaining to single rackets. Good service counts little towards successful play, which depends more on accurate placing of the ball. Squash grew in popularity as a game, and as a form of exer-

cise, in the years between the two Great Wars, and many new courts were built, e.g. at Ealing, Grosvenor House, Dolphin Square, etc., supplementing older and more famous club courts at Lord's, Queen's Club, etc. *See* Rackets; *consult also* The Game of Squash, Eustace Miles, 1901.

Squaw. Married woman of an American Indian tribe. Squawman is the name given to a white man who marries an Amerind woman, in order to obtain land within the Indian Reservation. *See* American Indians colour plate; Iroquois.

Squeers, WACKFORD. Character in Dickens's novel Nicholas Nickleby. He is a schoolmaster in charge of Dotheboys Hall (*g.v.*), typical of the questionable Yorkshire schools which Dickens had set himself to expose in that book, and which he helped thereby to make obsolete. Squeers is an ignorant, avaricious brute who starves and bullies the unwanted boys who form the majority of his pupils. He has a wife, who gives a daily dose of brimstone and treacle to the boys; a daughter, Fanny; and a spoilt son, Wackford. Nicholas, who goes to the school as an assistant master, thrashes Squeers before the boys.

Squib. Word used in several senses including (1) a small firework of cylindrical form charged with a composition throwing out a fountain of sparks ending with the explosion of a small charge of gunpowder; (2) miner's squib, a small cylindrical case filled with a slow-burning composition used to fire a blasting charge in mining. *See* Fireworks.

Squid. Name popularly given to the genus *Loligo* of the cuttles, found around the British coasts. The common species (*L. forbesii*)



Squid. Giant specimen of this cuttle fish, measuring 80 ft.

has a rather long, cylindrical body, a short head surrounded by tentacles, and two triangular "fins" on the hinder portion of the body. Active animals, able to swim rapidly backwards, they feed upon small molluscs and crustaceans. *See* Cephalopoda; Cuttle.

Squill. Dried bulb of *Urginea scilla*. The glycosides of squill act on the heart in the same way as those of digitalis, but the drug is mainly used as an expectorant. Red squill is used as a rat poison.

Squillace, GULF OF. Wide opening of the Ionian Sea in Calabria, S. Italy. It is 35 m. wide between Cape Rizzuto and Punta Stilo.

Squint OR HAGIOSCOPE (Gr. *hagios*, holy; *skopein*, to look at). In church architecture, a narrow opening or slit in a wall, enabling persons in the transept or elsewhere to see the elevation of the Host.

Squinting OR STRABISMUS. Defect of the eye. In it the visual axis of one of the eyes deviates from its proper position, with the result that the two visual axes cannot be directed simultaneously upon the same point. It is due either to paralysis or over action of one of the muscles which move the eyeball. The condition is common in children and is curable by special exercises for the eye muscles, or by a delicate operation. See Eye.

Squire. Shortened form of esquire (q.v.). The term is specifically applied by popular usage to the principal resident in an English village or country district, who is usually a justice of the peace.

The abnormal taxation which followed the First Great War led to many estates changing hands, and to a decline in the traditions of squirearchy, but their disintegration had set in earlier, for similar complaints were expressed by W. Cobbett in his Rural Rides. The squire is a popular character in English fiction from the days of Fielding, whose contrasted types, Squires Western and Allworthy, both in the novel Tom Jones, may be compared with Sir Roger de Coverley of The Spectator. See Esquire.

Squire, SIR JOHN COLLINGS (b. 1884). An English man of letters. Born at Plymouth, April



Sir John Squire, English writer

2, 1884, he was educated at Blundell's and Cambridge. As Solomon Eagle he contributed regularly to The New Statesman for many years, becoming literary editor of that journal in 1913, and editor 1917-18. In 1919 he founded a new literary monthly. The London Mercury, and edited it until it ceased publication in 1934. This periodical enabled

him to give practical encouragement and help in their development to many younger writers, some of whom found it an opening to later success. A prolific writer, he achieved high repute as poet, parodist, short-story writer, and critic. His parodies are found in Steps to Parnassus, 1913; Tricks of the Trade, 1917; and Collected Parodies, 1921. He also edited the English Men of Letters series of biographies, collaborated in writing the play Berkeley Square, 1926, and published two books of reminiscences. The Honeysuckle and the Bee, 1937, and Water Music, 1939. Squire was knighted in 1933.

Squirrel (Gr. *skia*, shadow; *oura*, tail). Genus of small rodents of the family Sciuridae. The common squirrel (*Sciurus vulgaris*) occurs throughout Europe and N. Asia; but the British variety differs considerably in colour and seasonal changes from its Continental allies. It is 8 ms. long in body, with a tail of 7 ins. In the winter the coat is brownish red on the head and back, grey at the sides, chestnut on the limbs, dark reddish-brown on the tail, and white on the under parts; and the ear-tufts are long and conspicuous. In the summer the grey disappears from the sides, and the sides of the tail become buff or even cream-coloured; while the ear-tufts are much reduced in size.

Squirrels are common in most wooded districts of England and Wales; but in Scotland and Ireland they are local and sometimes rare. They spend most of their time in the trees, and on the ground progress by a series of bounds. They build nests of leaves, grass, and bark in hollows and forks of trees, in which to rear the young, which are born in June. Large stores of nuts, etc., are laid up for the cold season; but these are generally distributed over several hiding-places instead of forming a single hoard. The animals hibernate in cold districts.



Squirrel. 1. The common red species. 2. The grey squirrel, an increasing pest in the U.K. 3. Indian palm squirrel

The grey squirrel (*S. Carolinensis*) is a N. American species. Introduced into Great Britain in the 19th cent., it became a pest, and is treated as such under the Agriculture Act, 1947. See Flying Squirrel; Prairie Dog; Sable.

The small, golden-haired S. American squirrel monkey (family Cebinae) is so called from the resemblance of its head to a squirrel's.

Squirting Cucumber (*Ecbalium elaterium*). Annual herb of the family Cucurbitaceae, native of the Mediterranean region. It has trailing stems, and heart-shaped leaves with toothed margins. The flowers are yellow, and the fruit is a small green prickly gourd. When ripe, the fruit parts from its stalk and violently ejects its seeds, together with the thin pulp surrounding them, through the base.

Srinagar. Capital of Jammu and Kashmir, the state whose conditional accession to India in 1947 led to a dispute between India and Pakistan. The town stands on both banks of the Jhelum, 5,000 ft. above sea level, 175 m. N.N.E. of Lahore, in the fertile vale of Kashmir. Quaint timber dwellings surround the palace and fort, and stretch along the river banks, which are joined by picturesque wooden bridges. The former manufacture of shawls and carpets is decayed. A stone temple crowns the hill, the Throne of Solomon, and a fort built by Akbar surmounts the hill, Hari Parbat. The town was formerly the hot weather capital of the Mogul emperors. In 1947 Indian troops occupied Srinagar to pre-



Srinagar, Kashmir. A view of the town, and capital of Jammu and Kashmir, on the banks of the Jhelum river

vent its capture by Pathan tribesmen. Pop. 207,787.

Srirangam. Town of Madras state, India, in Trichinopoly dist. It is situated on Srirangam Island in the Cauvery river, N. of Trichinopoly. There is a temple with 14 gate towers. Pop. 27,000.

Srivilliputtur. Town of Madras state, India, in Ramnad dist. It is situated S.W. of Madura on the road and rly. to Travancore. Pop. 31,195.

S.S. Troops. Branch of the German Nazi party army. The initials are an abbreviation for *Schutz-Staffel*, protective squadron, and the formation was organized in 1928 as an élite corps of Storm Troopers (*q.v.*). Only reliable and fanatical party members were admitted to the S.S., and after the purge of the Storm Troop organization in 1934 it assumed increasing importance. It was administered on strictly military lines, and at its peak had a strength of 450,000. Members, who wore black uniforms, enjoyed numerous privileges, but were subject to a strict marriage control on racial grounds. The S.S. provided Hitler's bodyguard and was under the direct command of Himmler. Many armoured and other élite formations of the German army had only S.S. personnel, and during the Second Great War these fought with outstanding courage and stubbornness, *e.g.* at Anzio, Italy. At the trials held at Nuremberg, 1945-46, the organization was judged to be criminal.

St. Abbrev. for saint. In this Encyclopedia, as in most works of reference, place names, etc., beginning with this abbreviation, *e.g.* St. Albans, are entered as though spelt Saint Albans. Saints themselves are described under their own names, *e.g.* Matthew. See also San, Santa, and Santo.

Stabat Mater (Lat., the mother was standing). Opening words, used as the title, of a Latin hymn on the Crucifixion. Of uncertain

authorship, it has been ascribed to Pope Innocent III (1161-1216) and to Jacopone (c. 1306). It is fairly certain that it dates from the 13th century, and was one of the hymns sung by the fanatic bands of Flagellants in the 14th century. By the 15th century it was used as a Sequence, and in 1727 it was recognized as liturgical by being included in the Roman Missal. There have been several settings by famous composers, notably those of Palestrina, Rossini, Verdi, Dvorak, and Stanford.

Stabiae. Ancient town and seaport of Italy, in Naples prov. It was adjacent to Pompeii, with which it was destroyed by the eruption of Vesuvius in 79. Here Pliny met his death. Near the site is Castellamare di Stabia (*q.v.*), where in 553 the battle between Narses and Teias terminated the power of the Goths in Italy.

Stability. Property of a body, or of a system of bodies or forces, by virtue of which there is a tendency to return to a position of equilibrium if there is any displacement of the body or the systems.

A body may be in stable equilibrium either at rest or in motion. In the former case the stability is static, in the latter kinetic. The former is a particular case of the latter. A body suspended from a point about which it can turn freely may be in equilibrium in two ways. Its centre of gravity and the point from which it is suspended must be in a vertical line. If the point of support is above the centre of gravity, then, when the body is displaced, the weight of the body tends to bring it back to its original position, and the position is stable. If, however, the centre of gravity is above the point of support, then any turning movement will tend to increase the displacement, and to move the body farther and farther away from its original position; the equilibrium is unstable. If centre

of gravity and the point of support coincide, the equilibrium is said to be neutral.

When a body is in a position of stable equilibrium, the potential energy is at a minimum. In unstable equilibrium any slight displacement tends to lower the centre of gravity, and the body's potential energy is at a maximum. What is true of bodies under the action of gravity only may be generalised so as to apply to the equilibrium of a body under the action of any system of forces, so that, by considering whether the potential energy of the system is at a maximum or a minimum, we can say whether the system is in unstable or stable equilibrium. Examples of moving bodies in stable equilibrium are a spinning top, gyroscope, etc. A top at rest on its point is an example of static instability and on its broad end of static stability.

Staccato (Ital., detached). Musical effect, gained by separating the notes by rests, although these are not written in the music. It is indicated in three ways, by placing above or below the notes (1) dashes (*spiccato*), in which the notes are shorter than the rests; (2) dots (*staccato*), in which the two are about equal; and (3) dots underneath a curved line (*mezzo-staccato* or *portamento*), in which the notes are longer than the rests.

Stachys. Genus of plants of the order Labiales. See Woundwort.

Stacpoole, HENRY DE VERE STACPOOLE (b. 1865). British novelist. The son of a clergyman at Kingstown (Dun Laoghaire),

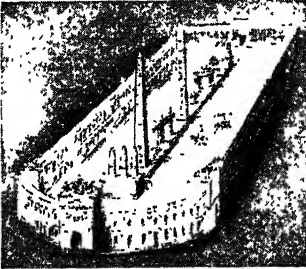


H. de Vere Stacpoole, British novelist

Dublin, he was educated at Malvern and studied medicine, but abandoned practice for literature. He published several very successful stories, becoming famous with *The Blue Lagoon*, 1908, a sentimental romance of life on a South Sea island. This was made into a play in 1920 (Prince's Theatre, London), and more than one film version followed. Other books include *The Pools of Silence*, 1909; *The Street of the Flute Player*, 1912; *The Beach of Dreams*, 1919; *Golden Ballast*, 1924; *The Lost Caravan*, 1933. He translated Villon's *Poems*, 1913, and published a biography of Villon, 1916. *The Story of My Village* appeared in 1947.

Stade. Town of Germany, in Lower Saxony. It stands on the Schwinge, a trib. of the Elbe, 22 m W. of Hamburg. It has manufactures of cloth, flannel, leather, and rubber, iron foundries, and a trade in fruit. A Hanseatic town, it became the capital of a Swedish duchy in 1614, and was sold to Hanover in 1719. It was destroyed by fire in 1639. It lay in the British occupation zone after Germany's surrender, 1945. Pop. 20,000.

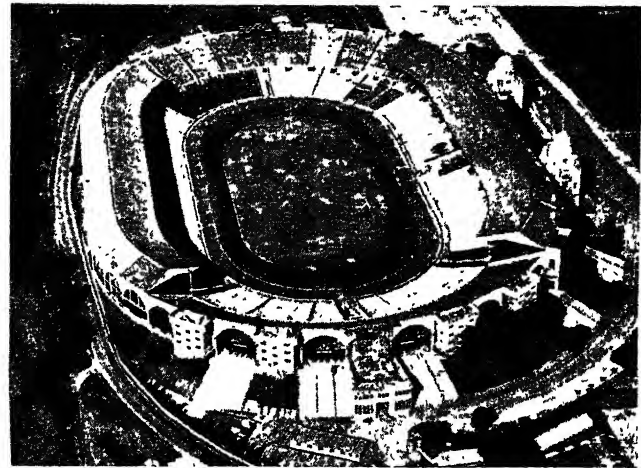
Stadium (Gr. *stadion*). Greek measure of length equivalent to about 582.5 English feet. This was



Stadium. Plan of an ancient Roman stadium. Top right, air view of the Wembley Stadium, Middlesex, opened 1923

the distance of the short race at Olympia, and the name came to be applied, first to the race, and then to the building in which the racing and the other contests, except the horse-races, took place, not only at Olympia but elsewhere. The stadium at Olympia was rectangular, but most of the others had one semi-circular end, near which was the goal. One or both sides were often fashioned from the slopes of a hill. The revived Olympic Games at Athens in 1896 were held in the old Athenian stadium, restored for the purpose. The word has been revived in modern times to describe various athletic grounds surrounded by tiered seats for spectators, especially in the U.S.A. The two notable examples of modern stadiums in the U.K. are the one at Shepherd's Bush, London, constructed in 1908 for the Olympic Games of that year, and forming part of the so-called White City originally laid out for the Franco-British exhibition of 1908; and that at Wembley, opened 1923 as part of the British Empire exhibition of 1924, and scene of the F.A. Cup Final from 1923 onwards. Wembley can accommodate 95,000 spectators; the White City 68,000. *See* Circus; Olympic Games: Rome; Wembley

Stadtholder (Dutch *stadhouder*, substitute, deputy). Chief magis-



trate of the United Netherlands. The title was originally given to the representatives of the Spanish crown in the Netherlands. After the revolt of the seven states from Spain, 1579, Friesland elected John of Orange as stadtholder, while the six remaining states chose his brother William the Silent (*q.v.*). The authority of the stadtholders was based solely on the powers delegated to them by the states. On the death of William's grandson, William III of England, in 1702, the descendant of John became stadtholder. *See* Netherlands; Orange.

Staël, ANNE LOUISE GERMAINE, BARONNE DE (1766-1817). French writer. She was born in Paris, April 22, 1766, daughter of the financier Necker, and at twenty became the wife of the Swedish minister, the Baron de Staël-Holstein, from whom, however, she was separated in 1798. Driven from France by the Revolution, she retired to her father's estate at Coppet, near Geneva, and though she returned to Paris in 1797, she was presently exiled by Napoleon. M. de Staël died in 1802, and in 1811 his widow married a Swiss officer, Albert de Rocca, and after travelling extensively settled in Paris on the fall of the Empire. She died there, July 14, 1817.

Madame de Staël's principal works are her early *Lettres sur Rousseau*, 1788; two sentimental novels of passion, *Delphine*, 1802,

and *Corinne*, 1807 (both studies of "la femme supérieure"); two long treatises, *De la Littérature Considérée dans ses Rapports avec les Institutions Sociales*, 1800, and *De l'Allemagne*, 1810; and the posthumously published *Considérations sur la Révolution Française*, and *Dix Années d'Exil*. Madame de Staël holds an important position in the history of French literature. By her cosmopolitanism and her social treatment of literature, she helped to break down the dogmatic criticism of the classic school, while she performed an even greater service for French readers by opening up to them the new world of German idealistic philosophy and romance.

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Staff. Word meaning a stick, a variant being *stave*. It has several compounds, *e.g.* flagstaff and quarterstaff, while the pastoral staff has become a symbol of office. The main use of the word, however, is for those who assist *e.g.* a soldier or sailor in high command, or the workers in a business and kindred undertakings.

In modern warfare the general staff is the directing brain of an army or navy. The idea was developed by the Prussians, who were the first to maintain a regular staff in times of peace, its duties being to prepare plans of campaign and



Mme. de Staël, French writer
After P. L. Boulvier

arrange for feeding and transporting armies. In the U.K. an imperial general staff was created early in the 20th century. See Moltke; Stave; Strategy; Tactics; War.

Staff. Term in engineering for an instrument used with a surveyor's level or theodolite for reading varying ground levels. The modern staff can be extended for about 5 ft. 6 ins. in length to 14 ft. or more, and is divided throughout its length into feet and inches, or metres and decimals. It is placed vertically on the ground at a distance from the observer, who reads through his level or theodolite the level at which his instrument stands. After allowing for



Stafford, England. The castle, built on the site of a Norman stronghold. Top right, the church of S. Mary

the height, the difference in level of the ground at the two points is ascertained by subtraction.

Staffa. Island of the Inner Hebrides, Argyllshire, Scotland. Lying 6 m. N. of Iona, it is 71 acres in extent, and rises to a height of 145 ft. Its coast is remarkable for a number of caverns, the most notable being Fingal's Cave, the entrance to which is constructed of columnar basalt; it is 66 ft. high, 42 ft. broad, and 227 ft. long. The chief of the other caves, seven in all, are McKinnon's or Cormorants' Cave, Boat Cave, and Clamshell or Scallop Cave.

Staff College. An institution where officers are specially trained in the subjects required for staff and other senior appointments. By training officers in this way, it is possible to ensure uniformity in the theory of tactics and organization. British institutions are the Royal Army staff college, Camberley; the Royal Naval staff college, Greenwich; and the R.A.F. staff

college, Bracknell. The Imperial Defence College, Belgrave Square, London, trains officers and civilian officials in the broadest aspects of imperial strategy.



In 1946 was established an administrative staff college at Henley-on-Thames, to bring together men and women of executive responsibility from industry and commerce, trade unions, and central and local government, to study the common principles that underlie effective administration. Students are nominated by their employers. The principle of the staff college has been adopted by many large companies and corporations as a regular feature of their organization.

Stafford. Mun. bor. and co. town of Staffordshire, England. It stands on the little river Sow, 23 m. N.N.W. of Birmingham, and is served by rly. The principal churches are S. Mary's and S. Chad's. The former, a beautiful cruciform

Stafford arms

building with octagonal tower, mainly of the 12th century, was founded in 914, and was once a collegiate church. The latter contains Norman work. Stafford is a suffragan bishopric in Lichfield diocese. Other buildings include the shire hall, borough hall, guildhall, infirmary, technical college, William Salt library, and Edward VI grammar school. Notable old houses are High House, Chetwynd House, and the Swan Hotel, described by Borrow in *Romany Rye*. Stafford Castle is an uncompleted building overlooking the town: it occupies the site of a Norman stronghold. Stone Flat is a recreation ground.

Stafford is an important rly. centre and has engineering works.

Women's footwear and wood heels are principal manufactures. Salt is made and there are brine baths. Important in Anglo-Saxon times, Stafford appears as *Stadford* in

Domesday book, 1086. It was made a bor. c. 1206. It had its own M.P. till 1918, Sheridan being the member 1780-1806; Stafford and Stone now form a co. constituency. Izaak Walton was born here. Pop 36,500.

Stafford, WILLIAM HOWARD, VISCOUNT (1614-80). English nobleman. Born Nov. 30, 1614, fifth son of

Thomas, earl of Arundel, he was created Viscount Stafford, in 1640. He was one of the five Roman

Catholic peers denounced by the perjurer Titus Oates (*q.v.*), and was arrested and put on trial for high treason, Nov., 1680. Convicted after an unfair trial on the false witness of Oates

Viscount Stafford, English nobleman. After Van Dyck

and his fellows in the Popish Plot (*q.v.*), Stafford was beheaded on Tower Hill, Dec. 29, 1680.

Stafford House. Former name of the London mansion now known as Lancaster House (*q.v.*).

Staffordshire. County of England. With an area of 1,153 sq. m., it is one of the midland counties, lying somewhat to the west. Its surface is low or undulating save in the N., where the Pennines enter it, and on Cannock Chase. Axe Edge, on the Derbyshire border, is 1,684 ft. high. The chief river is the Trent, which rises in the county; others are its tributaries, Sow, Tame, Blythe, Churnet, and Dove. Rudyard Lake is in the county. In the N. is the district known as the Potteries; in the east is Cannock Chase, once a hunting ground, but now a coalfield; and in the S. is part of the so-called Black Country, with its coalfields and ironworks. Elsewhere agriculture is carried on, the chief branches being the rearing of cattle, the cultivation of wheat, barley, and oats, and dairy farming. The county is well served by rly. and canal.



Staffordshire. Map of this midland county of England, famous for its potteries, coal mines, and brewing

Stafford is the county town, but there are a number more populous, e.g. Stoke-on-Trent, Wolverhampton, Walsall, Smethwick, West Bromwich, Wednesbury, and Burton-upon-Trent. Smaller places which possess historic interest are Lichfield and Tamworth. In the co. are part of Dove Dale, a beauty spot, Tutbury with its ruined castle, Chartley with its wild cattle, Alton Towers, and Beaudesert. The university college of N. Staffs was opened 1950 at Keele, near Newcastle-under-Lyme. The co. includes six co. constituencies, and is in the diocese of Lichfield.

Before the Norman Conquest Staffordshire was part of Mercia. Much of it was then and later covered with forests, of which there are remains in Needwood. Coal was worked as early as the 13th cent. and in the 18th pottery making started. The two Staffordshire regiments are the North Staffordshire (q.v.) and South Staffordshire (q.v.). Pop. 1,431,359.

LITERARY ASSOCIATIONS. Izaak Walton was born at Stafford, but the county's chief centre of literary interest is Lichfield, where Samuel Johnson was born. His birthplace is preserved as a Johnson museum, and statues of him and his biographer, Boswell, are in the town

Lichfield grammar school has memories of many famous pupils, including, besides Johnson, Joseph Addison, Elias Ashmole, and David Garrick. Ashmole was born in the house next to that in which Johnson was born; and Garrick and Erasmus Darwin lived in adjoining houses in Beacon Street. Anna Seward is known as the Swan of Lichfield; Ella-stone, by the Derbyshire border, is said to be the Hayslope of Adam Bede. The Potteries district—the Five Towns (q.v.), now incorporated as the city of Stoke-on-Trent—formed the background of many of Arnold Bennett's earlier novels.

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Stag. Male of the red deer (*Cervus elaphus*). It is distinguished from the hind, or female, by the presence of antlers on the head, and is of larger size. See Deer.

Stag Beetle (*Lucanus cervus*). Popular name for a large lamellicorn beetle. The male has large mandibles, which bear some resemblance to the antlers of a stag. The largest British species of beetle, being sometimes over two inches long in body, it occurs locally in the S. counties of England; and the larvae live in decaying oak trees. See Beetles, colour plate; Insect.

Stage (Old Fr. *estage*, Ital. *staggio*, from Lat. *stare*, to stand). A floor or platform raised above the level of the surrounding ground for any purpose, and, specifically, the raised platform in a theatre on which a play is presented.

In its earliest crude form the stage was merely the table on which Thespis (q.v.) placed the actor, who thence addressed the chorus ranged at an equal height upon the steps of the altar of

Bacchus, the table (*eleos*) being separated from the altar (*thymelē*) by an intervening space. In the great theatre of Dionysus at Athens, the *skênē*, or stage, stood opposite the amphitheatre of seats, and on a level with the lowest row. In breadth it was nearly equal to the diameter of the semi-circular part of the *orchestra* (q.v.), and it was cut breadth-wise into two divisions. The front portion, called *logeion*, was a narrow parallelogram projecting into the orchestra, and, being the stand of the actors when speaking, was constructed of wood for better reverberation of the voice. The hinder portion, the *proscenium*, was built of stone to support the heavy scenery and decorations. Backed and flanked by lofty stone buildings, it represented externally a palace, and contained within rooms for the actors and receptacles for the stage machinery. In the central edifice were three entrances upon the *proscenium*, royal personages emerging from the ornamental portal in the middle, and inferior personages coming on from the side entrances. On each side of the *proscenium* ran high lines of buildings with architectural front, containing passages communicating with the stage and its contiguous rooms.

The elimination of the religious element from dramatic representations entailed the abolition of the chorus, with consequent occupation of the Greek *orchestra* by the audience, and was also responsible for enlargement of the stage to accommodate the entire company of actors. This was one of the respects in which the Roman theatre differed from the Greek, and is characteristic of the modern theatre. In these the notable features of the stage are its great depth, its rake, or slope of floor from back to front, to set all the actors in perspective view, and the great depth below and height above it, to permit of the raising or lowering of scenery and the utilisation of mechanical means of obtaining spectacular effects. The elaboration of these has given many devices of extreme ingenuity.

Panoramic scenery, moving upon an endless roller to give the illusion of lateral movement, and remarkable improvements in illuminants and lighting arrangements render possible effects unimaginable to the great stage craftsmen of the Greek classic drama. Essentially, however, their stage machinery seems to have included all that modern ingenuity has devised, and their stage to have been

adequate for the proper exhibition of dramas which are the models for all time. *See* Apron Stage; Drama; Theatre.

Stage, THE. British weekly journal devoted to the theatre in all its branches. It was founded in 1880 by Charles L. Carson and Maurice Comerford. The former was editor until 1900, the latter succeeded him until 1903. Later editors were Lionel Carson, son of the first editor; Bernard Weller, and (since 1943) S. R. Littlewood. The journal is still issued by the firm of Carson and Comerford, Ltd., from offices at 19-21, Tavistock Street, London, W.C.2.

Stage-coach. Public passenger conveyance, plying regularly by stages between two towns. *See* Coaching; Motor Coach; Posting.

Stage Society, THE. British society for the production of dramas of literary merit which otherwise appeared to have little prospect of securing performance. Founded in 1899, the Stage Society's first production was Bernard Shaw's *You Never Can Tell*, at the Strand Theatre, London, May 2, 1900. Among other famous plays first produced under the auspices of the society was *Journey's End*, by R. C. Sherriff, in Dec., 1928. The society's activities lapsed after 1939.

Staggered Hours. A term applied to a proposed device for spreading the load of passengers on local transport services during rush-hours, by varying the starting and finishing times of work in different undertakings. In London buses, trams, and railways in 1947 carried on weekdays between 8 and 9 a.m. and between 5 and 5.30 p.m. several millions of passengers; far more than could be dealt with efficiently by the resources of vehicles, rolling stock, and officers. Extensive publicity campaigns failed to produce any appreciable "staggering," and a representative committee was set up in 1947 to arrange it systematically with individual employers. The same problem arose in most provincial centres.

The concentration of the holiday season into three months of the year presents similar difficulties even more serious, particularly since the passing of the Holidays with Pay Act, 1938. Pressure on seaside accommodation was lessened by staggering holiday weeks in towns and by the individual employers in fixing holiday weeks outside the month of August.

The necessity for the staggering of hours of work was emphasised

by the post-war experience of the electricity grid system. Consumption of electricity, both domestic and industrial, vastly increased after 1939; but facilities for providing electricity had decreased rather than increased owing to the cessation of all new construction and arrears of repairs during the war. The load, however, varied considerably from time to time during the day. To avoid complete breakdown of the system various forms of compulsory staggering of the load were introduced as a temporary measure, some factories, having even to transfer certain shifts from day to night.

Staggers. Complaint affecting horses and sheep. It is characterised by trembling, swaying, or falling due to imperfect coordination of the voluntary muscles, and has various origins. In sheep it may arise from louping-ill, or from the presence of hydatids in the brain. In horses staggers may be due to indigestion and constipation, to heart failure, diseased blood vessels, or to tumours on the brain. *See* Horse; Sheep.

Stag-horn Moss (*Lycopodium clavatum*). Popular name for certain club-mosses. *See* Club-moss.

Staghound. Name given to several breeds of hounds used for hunting the stag. The old English staghound, now thought to be extinct, was a variety of bloodhound, a large heavy animal with short broad head, pendent ears, dewlap, and heavily fringed tail. There were two strains, the northern and southern. The modern staghound is a large foxhound (*q.v.*), trained for the special work of stag-hunting. About a dozen packs exist in England, and a few in Ireland. The name staghound is also sometimes given to the Scottish deerhound.

Staghunting. Form of the chase common from ancient times in England and other countries. There are three kinds of deer in England which are hunted with hounds: the red deer on Exmoor, in Yorkshire (Ribblesdale), and in the New Forest; the fallow buck in the New Forest; and the roe deer in Dorset. Carted deer are also hunted in various districts.

The quarry is a "warrantable" deer, *i.e.* one old enough to be hunted, if possible, a hart, *i.e.* a stag of five years old or upwards, the object of the huntsman being if possible to kill the oldest deer. If, however, a one-horned stag, a hornless stag, or one with spike horns is known to haunt a covert, he is always killed if possible. In

the early hours the harbourer tracks the stag to the coverts, where it lies up for the day. The stag to be hunted must be separated from the others. For this purpose from two to nine couples of hounds, known as tufters, are taken to the covert, where, perhaps after two or three hours, more or less, they force the stag into the open. Then the tufters are stopped and the pack brought up from some convenient barn or stable in which it has been shut up. The tufters, released, pick up the line, and soon the whole pack is stretching away over the heather.

The chase takes from 40 minutes to two or three hours. Unless the stag beats the pack, he is generally brought to bay in a stream, where a rope is thrown over his antlers, and a keen knife ends the chase. Stags are hunted from Aug. 12 to Oct. 8, hinds from Nov. to Christmas or later. Generally about Easter the master devotes ten days to hunting the young deer, three and four years old. *See* Dog.

Stagira or **STAGIRUS.** Ancient town of Macedonia. It was situated on the Strymonic Gulf, and its site is occupied by the modern village of Stavro. It was founded in 655 B.C. by a colony from Andros, and became celebrated as the birthplace of Aristotle (*q.v.*).

Stahl, GEORG ERNST (1660-1734). German scientist. Born at Ansbach, Oct. 21, 1660, he was



G. E. Stahl,
German scientist

appointed to the chair of medicine and chemistry at Halle university, 1694. Stahl became one of the foremost chemists of

his generation,

and wrote many books on chemistry in which he showed the fallacy of many scientific ideas of his time. He was one of the exponents of the phlogiston theory (*q.v.*). He died in Berlin, May 14, 1734.

Stained Glass. Strictly speaking, any glass coloured either in process of manufacture or by subsequent treatment. In practice, the term is confined to the art and craft of making windows of glass thus coloured.

Glass stained in the making is termed "pot metal," and the earliest windows consisted essentially of pieces of coloured glass bonded together by lead strips which also supplied the outline of the design.



The manufacture of coloured glass was understood in very early times, but as windows played little part in early civilization it was not until the great architectural revival of the 11th century that the stained-glass worker had full scope for his genius. The art had not wholly disappeared during the interval, but no glass windows earlier than the end of the 11th century exist. The oldest are at Le Mans (c. 1090) and Augsburg (possibly 1065). In England the earliest window is claimed for several parish churches. Brabourne, Kent, has a window evidently early 12th cent., and Rivenhall, Essex, has pieces which may be earlier. English glass of importance begins in the 13th cent.

By A.D. 1134 the use of stained glass had become sufficiently lavish to provoke the Cistercian edict prohibiting the use of any but "white glass." This had the effect of fostering the art of grisaille, i.e. windows consisting of "white glass" decorated with a pattern in the "brown pigment" and relieved by occasional insets of coloured glass. Early "white glass" invariably had a faint greenish tint and a silvery opalescence, and with the skilful use of lead and stain the grisaille window is one of the most exquisite products of the Middle Ages. The five great lancet windows of York Minster provide one of the finest examples of the art. These "Five Sisters" have an area of 1,250 sq. ft. and contain nearly 100,000 pieces. Other examples of grisaille are at Salisbury Cathedral.

By the 15th cent. the stained-glass maker had achieved some of his greatest triumphs. The finest

specimens are in the great French cathedrals, notably Chartres, but York Minster may claim to possess perhaps the most remarkable in its great east window (200 panels of subjects, comprising 78×33 ft.). This is rivalled by the great east window of Gloucester, 72×38 ft., which is somewhat older—about 1350. The York window was made by John Thornton of Coventry, 1405.

After the 15th cent. the use of enamels as a means of colouring becomes increasingly prominent and the

stained glass depends much upon the conditions of treatment. Iron will give shades from yellow to light blue, and copper from ruby to greens. Early glass workers were never quite certain of the results. There was also considerable variation in the thickness of glass.

Yet it was by taking advantage of these defects that the medieval craftsman achieved a unique quality in his productions. When the craft was revived in the 19th cent. the interest in medieval glass was such that the glass-maker sought to devise means of reproducing the "defects" which his predecessors had so laboriously eliminated.

An important modification of pot metal is "flashed" glass. If the blowing tube were dipped first in one colour and then in another,

the final sheet had a thin film of the second colour on the outside. This appears to have been done from the earliest times in the case of red, as red glass alone is too heavy and intense in colour. The extension of the practice to other colours naturally followed, and after the 14th cent. such combinations were freely used. Even more ambitious schemes involving four or five colours were attempted, not always with the happiest results. The use of "flashed" glass afforded a means of producing a two-colour design in a single sheet of



Stained Glass. Assembling pieces of coloured glass on to an outline of the original design, seen in the background. Top, painting the pieces of glass already cut to pattern

stained-glass window tends increasingly to become merely a picture on glass, the qualities inherent in the nature of the materials being ignored.

The art degenerated as the technical resources improved. Judged by scientific standards, early glass was full of defects. The sheets were small, and were made by blowing a cylinder of glass and cutting it open down one side. It was then placed in a heated chamber and allowed to open out on a flat surface, thus forming a sheet. The under-side naturally showed the irregularities of the surface upon which it lay, while the upper surface had the characteristic striations produced during the blowing. Further, the means of fusion were not sufficiently under control to ensure regularity of colour and freedom from bubbles. The colour of

glass without the use of lead, by abrading one layer. This was a laborious process until the discovery of the value of hydrofluoric acid as an etching material, after which it became a simple practice, and consequently almost a matter of routine in the glass workers' factory.

The possibilities of design with pieces of coloured glass outlined by lead are clearly limited. With the desire to produce pictorial and more or less naturalistic designs, the use of some kind of paint or enamel was imperative, e.g. in depicting human features or the folds of a robe. This was effected by the use of a brown enamel consisting essentially of iron oxide mixed with a glass somewhat more fusible than the sheet. The design was painted in and the sheet again fired. This was used for shading and fine work, and is artistically in a different category from the

coloured enamels which later were used specifically as colouring agents.

In the 14th cent. it was discovered that silver salts fired on the glass gave a wide range of yellow stains, from a delicate primrose to an intense orange. This, together with the brown pigment, gave the artist full scope for resplendent work.

In 15th century windows, design is stronger, drawing and shading more delicate, and the proportion of white glass increases. The sheets of glass are larger and white glass clearer, whilst in flashed glass variation in the thickness of the coloured layer is less marked.

Decline and Revival

Many factors led to the decline of the art. The Renaissance and the Reformation ended the long reign of the Church as almost the sole patron of the art. Reformers were interested in destroying rather than creating stained glass. On the other hand, the improvement in domestic and secular architecture opened new fields for the stained-glass worker. New aesthetic standards were created and a wider range of subjects was open to the artist. The greatly increased range of enamels gave him freedom from the limitations of leaded glass. This fact led to the painted window rather than the stained-glass window. Reynolds's famous windows in Oxford are typical.

Glass work fared better on the Continent. In Holland the work of the Crebeth brothers is outstanding. In Switzerland an interesting development was what is sometimes called "needlework." The glass is covered with a layer of paint and the design, often very elaborate, is scratched out with a needle. The Swiss were particularly successful in producing an enamel which did not tend to break away from the glass in course of time. In France and Germany much beautiful work was done, but the designs would look at least as well on an opaque background: they are designs transferred to glass, not designs in glass.

The middle of the 19th century brought a revival of interest and a steady progress, largely due to the work of C. Winston, who first investigated the properties of medieval glass upon which its peculiar artistic potentialities depend. The work of John Clayton deserves special mention, for he and his school were responsible for many fine windows, notably at Truro

Cathedral, King's College Chapel, Cambridge, and St. Augustine's, Kilburn. Burne-Jones also deserves mention as an artist who appreciated the peculiar nature of stained glass.

No wholly satisfactory system can be devised for the classification or chronologic division of the art. Three nations are pre-eminent—France, Germany, and England. It is usually said that France was supreme in the 13th and 16th cents. and England in the 14th and 15th, but even here the typically English grisaille windows challenge comparison with work elsewhere at any period. In Germany on the other hand there is an unbroken record of high achievement from the 11th cent. to the middle of the 16th.

There is also a marked difference in the way the art developed in the various countries. In Germany a certain conservatism led to a lagging in the adoption of new artistic styles, and throughout there is a tendency towards richness of colour and breadth of treatment. In England the 13th cent. was marked by the extensive use of clear glass (grisaille), so that in the succeeding period English glass tended to become richer in colour whilst in France and Germany the tendency was the other way. In France the reaction went rather too far. In Germany a compromise was effected by confining the rich colouring to the lower part of the window and glazing the upper portion in white glass. The "Geometric" style, in which white glass was covered with geometrical designs, is also characteristically German. Later, when the Gothic style was adopted in Germany, the effect of perspective was assisted by filling the characteristic canopies with small figures between and behind the pillars, hence the name "Interpenetrated," which corresponds roughly with Late Gothic in England. In France, the period and styles similar to English Perpendicular are termed Flamboyant.

For English glass the usual division is more or less according to architectural style. *Early English* up to about 1280; *Decorated*, 1280–1380; *Perpendicular*, 1380–1500; *Renaissance*, 1500–1550. A more general classification corresponds very closely to the centuries. *Romanesque* up to about 1300, the characteristic window being the medallion mosaic in which small pictures are surrounded by ornamental frames; *Early Gothic*, 1300–1400, charac-

terised by the introduction of silver stain and simple canopies but without any attempt at perspective (German Geometric comes in this period); *Late Gothic*, 1400–1500; *Renaissance* after 1500.

The study of stained glass is necessarily based mainly upon that in cathedrals, but even in medieval times it is clear that there was much stained glass in private houses. Chaucer's description of his room with windows in which "wholly all the story of Troy was in the glazing y-wrought" is an example. In addition, heraldic windows naturally figured largely in medieval art, and relics of many such windows are still to be seen.

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Stainer, JAKOB (1621–83). German violin maker. Born at Absam, near Innsbruck, July 14, 1621, he became a protégé of the archduke Ferdinand Charles from 1648 onwards. He was a highly successful maker of the violin, viol, viola da gamba, and other instruments, but had pecuniary disputes and died penniless and insane in 1683. Similar to the Amati violin, though less graceful, the Stainer commands a fair price, but is not so keenly sought as during the early 19th century. Jakob's brother Markus was also an able maker, but his instruments are very rare.

Stainer, SIR JOHN (1840–1901). British composer. Born in London, June 6, 1840, he was a chorister in St. Paul's cathedral, 1847–56, and in 1859 went to Oxford as university organist. He was organist of St. Paul's cathedral, 1872–88, and, knighted in 1888, became professor of music at Oxford in 1889. He died at Verona, March 31, 1901, and was buried in Oxford. An organist of great ability, he was also a composer of merit. Among his works are the oratorio Gideon, the



Sir John Stainer,
British composer



Top, The Adoration of the Magi, panels from a church in Normandy early 16th cent , lower left, the prophet

Ezekiel, part of a French 13th cent window lower right, St. Peter, 13th cent panel, S^{te} Elizabeth cathedral, Normandy

STAINED GLASS: THREE EXAMPLES OF FRENCH RELIGIOUS ART

Courtesy of Victoria and Albert Museum



Left, Swiss panel (c. 1493) by Lukas Zainer of Zurich, depicting the arms of the Baron von Wissenburg, centre, the Naivité, a German panel, late 15th cent.; right, The Holy Grad, stained and painted panel (1860-1890), designed by Sir E. Burne Jones, and made by Wm Morris and Co



how the sangral abideth in a far country
which is sarraz the city of the spirit

STAINED GLASS : PANELS OF SWISS, GERMAN, AND ENGLISH DESIGN

Courtesy of Victoria and Albert Museum

cantatas The Daughter of Jairus, 1878, and The Crucifixion, 1887.

Staines. Urban dist. of Middlesex, England. It stands on the left bank of the Thames, where the Colne flows into it, 19 m. from London. It has two rly. stations, and is also served by coach and bus from London, for which it serves as a riverside resort as well as an outer residential dist. Staines itself is a market town, but the urban dist. also includes Ashford, Stanwell, and Laleham. The chief buildings are S. Mary's church, rebuilt 1828, and enlarged 1885, with a fine peal of bells, and S. Peter's, 1894, built at the expense of Sir Edward Clarke.

Staines was a Saxon settlement, the name meaning stone, an important boundary stone (now in a recreation ground) being here from early times. For many centuries there has been a bridge across the Thames at Staines, the granite structure by Rennie being opened in 1832. The trial of Raleigh in 1603 took place in the old market house here. Near by is Runnymede (*q.v.*). Pop 37,600

Stainforth, GEORGE HEDLEY (1899-1942). A British airman. Born at Beckenham, he was educated at Dulwich and Sandhurst. As a flight-lieut. in the R.A.F., he was selected in 1928 for duty with the high speed flight. In 1929 he created a new world speed record of 336.3 m.p.h., and in 1931 represented Great Britain in the final race for the Schneider Trophy (*q.v.*), with an average speed of 379.05 m.p.h., only to beat this a few weeks later with 407.5 m.p.h. He received the A.F.C., and after service with the aircraft carrier *Glorious* and in Iraq he was promoted wing commander in 1940, and was killed in action over Egypt, Sept. 30, 1942, being buried in the British cemetery, Ismailia.

Staining. In a special sense, the treatment of wood with preparations which colour it without hiding the natural grain. The several types of preparations may be classified as follows:

(1) Chemical, *e.g.* treatment of wood with a solution of permanganate of potash, which produces a brown colour; or "oak" stain, produced by using a solution of sodium bichromate and ammonia tinted with vandyke brown. (2) Water stains, *i.e.* solutions of shellac in alkali (usually borax) and suitably tinted with dye. (3) Spirit stains, *i.e.* those based on a solution of

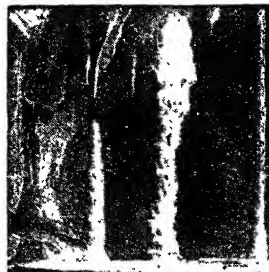
resin (especially manila copal) in methylated spirits, possibly with added dyes. (4) Coal tar stains, *i.e.* coal tar and coal tar distillates, such as are often used on out-buildings and places exposed to damp. (5) Oil stains, in which pigments such as siennas and umbers are ground in a hard drying varnish and diluted as required with a suitable thinner, *e.g.* turpentine or white spirit.

Stair, EARL OF. Scottish title held by the Dalrymple family since 1703. James Dalrymple, a lord of session, was made Viscount Stair in 1690 and was succeeded by his son John, who was lord justice clerk and lord advocate, and was created earl of Stair in 1703. His son John, 2nd earl, was a distinguished soldier and ambassador to France, and on his death, without heirs, in 1747, the succession to the title was disputed. The matter was settled in favour of James, nephew of the last earl. He also died without heirs, and the title passed through various successions to North Hamilton, 9th earl (d. 1864), from whom subsequent holders of the title are descended. The eldest son is called Viscount Dalrymple.

Stair, JOHN DALRYMPLE, 2ND EARL OF (1673-1747). Scottish soldier and diplomatist. Born July 20, 1673, second son of the 1st earl, he first saw military service under the prince of Orange in Holland, and later served under Marl-



2nd Earl of Stair,
Scottish soldier



Stalactites and stalagmites in
Cox's Gavern, Cheddar

Stairs OR STAIRCASE. Part of a building containing steps, leading from one floor to another, or from the ground to the entrance. The staircases of Greek and Roman architecture were constructed in the thickness of the walls. Those of the Middle Ages also, straight or spiral in form, were placed in inconspicuous positions. A medieval castle would be provided with a number of them, the steep, winding course of each being carried up the wall of a turret or buttress. The monumental exterior type is of classic origin, and was developed to the full in the Middle Ages. The ornamental staircase dates only from the latter part of the 16th cent. The square-planned or well staircase began to appear in the early 16th cent., but it was of the plainest character till the reign of Elizabeth.

Then a development took place in form and ornament. Although the corkscrew or spiral type was still retained in places, and certain splendid mansions, such as Hardwicke Hall, were content with plain flights of steps, the broad wooden staircase, with short flights connecting the landings, became the general rule. These were stoutly constructed with thick wooden balusters and massive handrails, the newels being carried up very high and finished with decorative finials. Crewe Hall, Hatfield House, and Cold Overton possess specially handsome staircases of this period. In the 18th century the height of the newels was reduced, the ornament simplified, and the whole construction became lighter. See illus p. 7742.

Stakhanovite. In communist countries a term applied to a worker or group of workers responsible for some exceptional feat of industrial output. It derives from the name of Alexei Grigoryevich Stakhanov (b. 1905), a Donbas miner, who in 1935 hewed 102 tons of coal (about 16 times the normal output) in one shift. In 1941 he was put in charge of a govt.

dept. for encouraging "socialist competition" among miners.

Stalactites AND STALAGMITES (*Gr. stalaktos, stalagmos*, from *stallassein*, to drip). Calcareous masses, usually conical or cylindrical in shape, formed by drippings from the roofs of caves. Water which

devoted himself to the improvement of his estates and to political machinations against Walpole, but in 1742 he was made a field-marshal and played a conspicuous part in the battle of Dettingen. He died in Edinburgh, May 9, 1747. See STRAUNER.



Stairs. Examples from English country houses. 1. Elizabethan oak staircase in the east tower, Grove Place, Hampshire. 2. Early Georgian, Finchcocks, Goudhurst, Kent. 3. Modern Classical, Fulbrook House, Farnham, Surrey. 4. Early Stuart (1619) open well staircase, with finely carved figures on the newels, Blickling Hall, Norfolk

By courtesy of Country Life, Ltd.

has passed through limestone contains dissolved carbonate of lime. This water may find its way to the roof of a cave, and thence drip to the floor. Each hanging drop is partly evaporated, and leaves behind a little carbonate of lime; successive drops leave more lime,

until an icicle-like pendant is formed. These stalactites are found in limestone caves; *e.g.* in England in the Peak and Cheddar districts.

Stalagmites are calcareous masses upon the floors of caves. They gradually grow on the spot where water containing dissolved

carbonate of lime drips from the roof, usually from a stalactite. *See* Jenolan Caves.

Stalag. Contraction of the German *Stammlager*, prison camp. It was used in the Second Great War to denote German prison camps for captive n.c.o.s and men. *See* Oflag.

Stalagmite. Calcareous accretion from the floor of a cave. It is described under Stalactite.

Stalbridge. Town of Dorset, England. It is 6 m. from Sherborne, with a rly. station. The chief occupations are found in the timber yard and glove factory.

The principal building is S. Mary's church, and there is a large market cross. Stalbridge is mentioned in Domesday book. Pop. 1,400.

Stalin. Name given in 1949 to the Bulgarian seaport formerly known as Varna (q.v.).

STALIN: LEADER OF THE U.S.S.R.

George Soloveytschik, Author of *Russia in Perspective*, etc.

This biography of Lenin's successor, who on Lenin's death triumphed over all his former leader's other associates, should be read in conjunction with Russia: History, and the biographies of other notable Bolsheviks: e.g. Bukharin; Lenin; Molotov; Rykov; Trotsky; Vysinsky; Zinoviev

Joseph Vissarionovich Stalin, prime minister (from 1946) and generalissimo (from 1945) of the U.S.S.R., and general secretary of the central committee of the Communist party (from 1922), was born on Dec. 21, 1879, in the small Caucasian town of Gori, near Tiflis. (Tbilisi). His real surname was Djughashvili, and Stalin is only one of the many adopted names he used throughout his long career as a professional revolutionary. *Stal* is Russian for steel, and the connotation presumably was originally intended to indicate his strong character.

Stalin's father was a Georgian peasant who eked out a miserable living first as a cobbler at Gori and then as a worker at the Adelskhanov shoe factory in Tiflis. The mother, likewise of Georgian peasant stock, was Catherine Geladze; she died in 1937, aged 78. She had had three children before Joseph, but they had all died in their infancy. Her entire affection became concentrated on the fourth-born, Soso (Caucasian pet name for Joseph), whom she dreamt of dedicating to the priesthood, while the father wanted the boy to be a cobbler like himself. The father died when Soso was 11, and he remained entirely in his doting mother's care. A violent attack of smallpox nearly killed the boy and left him pockmarked.

When Soso was 14, his mother obtained for him, with difficulty, a scholarship at the Greek Orthodox (Church of Russia) theological seminary in Tiflis. He spent five years there, but instead of developing an interest in religion, he was attracted by Marxism and revolutionary doctrines. In 1896 and 1897 he conducted Marxist study circles among his school-fellows, and the following year he formally joined the Tiflis branch of the Russian Social Democratic party. While still at school he adopted the first of his many pseudonyms, Koba, which was the

name of a popular romantic Caucasian hero. Other pseudonyms included David, Nijeradze, Chizhikov, and Ivanovitch; but Stalin is the one he bore longest and under which he entered history.



Joseph Stalin, leader of the U.S.S.R.

In 1898 he was expelled from the seminary, and from then onward he devoted all his time to revolutionary activities. During the next two or three years he concentrated on propaganda among the working men of Tiflis and other Caucasian industrial centres.

In 1901, the police authorities issued their first warrant for his arrest, but he managed to go into hiding and continued his work underground. The following year he organized an important strike at the Rothschild and Mantashev oil works and on April 5, 1902, he was arrested. Between 1902 and 1913 he was arrested seven times and exiled to Siberia six times. Five times he managed to escape.

During 1901-17, whether in or out of gaol, whether living in exile or working in the revolutionary underground (mostly in the Caucasus but at times also at St. Petersburg), Stalin was an active member of various Social Democratic organizations but nevertheless remained a very inconspicuous figure in the movement. He happened to be in prison in 1903 when he heard of the split between the Bolshevik and Menshevik wings of his party, and he promptly associated himself with the Bolsheviks. In Dec., 1905, Stalin met Lenin while attending, as a delegate from Transcaucasia, the first all-Russian Bolshevik conference in Tammerfors, Finland.

Despite the claim of his official biographers that he became one of

Lenin's closest associates there and then, or indeed that the two men had been working in constant personal contact before actually meeting, there is no evidence at all of a close working relationship until after the Bolshevik revolution in Nov. (Oct. old style), 1917. He was just one of many revolutionary agitators and terrorists, but nowhere near the top even in his own Bolshevik group.

Stalin attended the fourth congress of the Russian Social Democratic party in Stockholm in 1906, and the fifth in London in 1907, when the final rift between the Bolsheviks and the Mensheviks occurred. Apart from two other short trips abroad in 1912, when he visited Lenin in Cracow and also stayed a few days in Vienna, these are the only known occasions when Stalin ventured outside the Russian empire. The detail is important, because it distinguishes him from most of his revolutionary colleagues, who spent many years as exiles in western Europe and in America.

Arrests and Escapes

Escaping from Siberia to St. Petersburg early in 1912, Stalin took a certain part in organizing the May Day demonstrations, wrote some articles in the clandestine Bolshevik press, and participated in the secret, illegal preparations of his party for the coming elections to the fourth duma. On April 22, 1912, he was arrested in the street and banished again for a period of three years; but he managed to escape once more and in Sept. of the same year he was back in the capital. Together with Molotov, he directed the Bolshevik campaign in the duma elections, and when these were over continued to work with the group that had been elected. Re-arrested for the sixth time on Feb. 23, 1913, he was banished once more, and in Dec., 1916, he was about to be called up for the army. While travelling S. under police escort, he heard the news of the Feb., 1917, revolution and he hastened to Petrograd—this time a free man, capable of openly engaging in political activities as a member of the central committee of the Bolshevik party.

He contributed actively to the overthrow of the Kerensky govt., was a member of "The Five" during the October revolution, and afterwards of "The Seven"—thus being associated with Trotsky, Zinoviev, Kamenev, and the other famous Bolshevik leaders whom he later destroyed. From the

inception of the soviet govt. until 1923 he was people's commissar for nationalities. In 1918-20 he was also extremely active in the civil war, winning great fame by his defence of Tsaritsyn (renamed Stalingrad) against the Whites. In March, 1919, he was appointed by Lenin people's commissar for state control, a dept. later reorganized as people's commissariat of workers' and peasants' inspection.

At the 11th congress of the Bolshevik party (March-April, 1922) Stalin was elected general secretary of the central committee—a position he used to make himself dictator not only of the party but of the U.S.S.R. He was proposed for this post by Zinoviev, but significantly enough his official biographers claim that Lenin proposed the appointment.

When Lenin died in 1924, it was as yet by no means certain who would succeed him as the most powerful man in Russia. Stalin's position was a strong one, but Trotsky was generally considered as Lenin's most obvious successor. Moreover, there were many other leading Bolsheviks—e.g. Zinoviev and Kamenev, Rykov and Bukharin—who had been very close to Lenin, who were far better known than Stalin, and who were by no means certain to accept him as their new master. Indeed, a life and death struggle between these various groups and individuals broke out almost forthwith, and lasted 14 years. For it was only with the biggest and most brutal purges of 1938 that Stalin removed the last of the Bolshevik "Old Guard," destroying them one by one. Trotsky was the earliest victim; after banishment, then expulsion from Russia, and untiring persecution all over the globe, he was finally assassinated in Mexico. The others were made to appear at endless trials, were forced to accuse each other of the vilest crimes, to "recant," to "confess" the most fantastic "sins." They were physically destroyed on a scale unprecedented even in Russia.

While this struggle was raging, Stalin in 1926 published his book, *On the Problems of Leninism*, which exposes very freely his political philosophy and offers many valuable clues to his mind and character. He is a dull but prolific writer and orator, and speaks Russian with a strong Georgian accent. All his articles and speeches are available in print not only in Russian but in more than 100 different languages.



Stalin, with an interpreter, greeting Winston Churchill on arrival at Potsdam for the conference with President Truman, July 17, 1945

British Official

He was elected a member of the presidium of the supreme soviet of the U.S.S.R. in 1925, and continued to hold that position. He also became a member of the *politbureau* of the Bolshevik party, a member of the council for labour and defence, was chairman of the committee for drafting the soviet constitution in 1935, and chairman of the council of people's commissars from 1941 to 1946, when the name of this office was changed into that of president of the soviet council of ministers.

He took an extremely active personal part first in preparing Russia's national defences and then in directing her whole war effort in all its aspects—military, economic, political, and diplomatic. Indeed, it can be said that the three five-year plans which preceded the war were, among other things, instruments for the industrial organization of the country with a view to a military emergency.

Throughout the hostilities, when most of the soviet govt. was evacuated to Kuibishev, Stalin remained in Moscow. In Nov., 1943, he travelled to Teheran for a conference with Churchill and Roosevelt, this visit to Persia being his first journey abroad since 1912.

Stalin held many honorary ranks and titles in the U.S.S.R., including the order of the red banner (1919), the order of Suvorov (1943), the order of victory and order of the red banner (1944), order of victory and title of hero of Soviet Union, as well as the order of Lenin and medal of the gold star (1945).

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1942; E. Yaroslavsky, 1942; J. T. Murphy, 1945; L. Trotsky, 1947.

Stalinabad. Capital of Tadzhik S.S.R., centre of Stalinabad region. The former Dushambe, it lies in the W. of the Tadzhik republic, about 100 m. N. of the frontier with Afghanistan. It is connected by air with other towns of the republic, and with Moscow and Vladivostok; by rail with Termez, and by motor road, completed 1940, with Khorog in the Pamirs. It is a cotton manufacturing town. Pop. (1939), 82,540.

Stalin Canal. Most northerly section of the Baltic-White Sea canal (*q.v.*), R.S.F.S.R. It was completed in 1933.

Staliner. Capital of the South Ossetian autonomous region of the Georgia S.S.R. It lies 55 m. N.W. of Tbilisi, the capital of Georgia.

Stalingrad. City of the R.S.F.S.R. It lies on the river Volga 240 m. from its mouth, and is the chief town of the region of the same name. Formerly called Tsaritsyn, it was in 1918 the scene of the defeat of Denikin's White Russians by the Red army under Stalin's leadership; and its name was changed in his honour. Between 1922 and 1942 Stalingrad became the third largest industrial town of the U.S.S.R. with a pop. (1939) of 445,476. It was the first of the great towns built under the first five-year plan, 1927; it had broad tree-lined streets, and produced tractors and other agricultural machinery, lorries, and motor cars—38,000 tractors in 1935, 60,000 in 1939. It had also oil refineries and sawmills, and during the Second Great War, until devastated by the Germans, was an important producer of tanks and military vehicles. The Stalingrad region had a silk growing industry. *See* Stalingrad, Battle of.

STALINGRAD: THE BATTLE OF, 1942-43

Irene Clephane, Associate Editor, The Second Great War

A detailed account of one of the most critical engagements of the Second Great War, which marked the turning point in the struggle between the forces of the U.S.S.R. and the invading armies of Germany. See also Russo-German Campaigns

In the spring of 1942 the Germans decided to go for the oil in the Caucasus and leave for the moment the capture of Moscow and Leningrad. To gain control of Caucasia it was necessary to isolate it by driving through to the Volga. A hold on that mighty river would also interrupt the chief remaining means of transport of oil and grain from S. to central and N. Russia. The spot on the Volga chosen by the Germans for attack was the most westerly of its lower basin, Stalingrad, the former Tsaritsyn, now grown to the third largest industrial town of the U.S.S.R., and a highly important source of Russian war material, particularly tanks and vehicles. Stalingrad was not fortified, and with a maximum width of 5 m., it straggles along the right bank of the river for some 30 m. By the end of July, 1942, the Germans had reached the Don from Voronezh to the Sea of Azov except in the angle at the elbow of the river where the Russians still held the right bank between Kletskaya and Kalach, thus covering the direct road to Stalingrad. Below the junction of the Donetz with the Don, the Germans were already advancing into Caucasia.

Stubborn fighting for Kletskaya and Kalach began in the last days of July, but even after the Germans forced the river to the S.E. of Kletskaya on Aug. 23, thus threatening Stalingrad from the N.W., the Russians continued to hold a bridgehead on the right bank. Lower down the Don, the Germans made a first precarious crossing at Tsimlyansk on July 25, and by Aug. 5 reached Kotelnikovo, where they threatened Stalingrad from the S.W. Russian resistance was fierce, but by the first week of Sept. the Germans had advanced from their S.W. position to threaten the city also from the W. At times the Germans attacked on

a wide front, at other times on a narrow sector in an effort to drive a wedge into the stubborn Russian defence. They heavily bombarded chosen points from the air, obliterating the buildings in them. They gained ground, but often lost it again to Russian counter-attacks.

By the middle of Sept. fighting had reached the outskirts of the city which, however, was still far from that fall Hitler had confidently predicted would be rapid. From Sept. 23 a Russian force began to make its presence felt to the N.W. between the Volga and the Don, initiating local attacks on the entrenched positions the Germans had dug to protect the N. flank of the army attacking Stalingrad. These positions ran along the W. bank of the Don from Voronezh to the neighbourhood of Kletskaya and then across the river and E. to the Volga. The W.-E. section was strengthened by concrete works and dug-in tanks. Defence of the whole line was in

dustrial establishments in the N.W. of the city; while ferocious street fighting continued in localised attacks and counter-attacks along the whole length of Stalingrad. Dive bombers, tanks, light and heavy field artillery, machine-guns, mortars, grenades, and the automatic heavy-calibre small arms of the infantry were used in fighting that was particularly violent at street crossings. There had been no such fighting in history before, though it was to be duplicated in the battles of 1944-45 when the Germans were defending German-occupied and their own cities against the Allies.

The Germans opened each of their attacks by concentrating air and artillery bombardment on a few hundred square yards. When most of the buildings in the sector had been reduced to rubble small groups of sub-machine-guns, supported by tanks, crept forward under cover of the ruins and attempted to establish themselves. Every standing stone building became a fortress; and when the Germans captured the ground floor, the Russians climbed to the first and second floors, established machine-guns on the roof, and drove the Germans in the street back on to counter-attacking Russian columns. Such battles sometimes lasted for days.

The object of the Germans was to thrust through to the Volga, which would make impossible the reinforcing and supplying of the city across the river from Russia's vast untouched eastern empire. Such reinforcements and supplies came in by night throughout the battle, and guns of the Volga naval flotilla helped in the defence, the backbone of which was artillery established on the E. bank of the river. But rain, and mud, reduced the fierceness of the fighting. A new German offensive on Oct. 14 was damped down. As the result of a third in the fourth week of the month the Germans claimed to have reached the river; if they did reach it, they were very quickly driven back. Both armies now faced a winter of peculiar difficulty. Floating ice on the Volga made it difficult in Nov. to get supplies to the hard-pressed defenders; the Germans had to bring men and material over a thousand miles of devastated territory. Though temps. were not so low as those the Germans had suffered farther N. the previous winter, the winds blowing uninterruptedly across the steppes were bitter and penetrating.



Stalingrad Battle, inside Stalingrad,

German artillery shelling a factory, used by Russians as a base for counter-attack

the hands of troops of German satellite countries — Hungarians near Voronezh, Italians to Kletskaya, and Rumanians from there to Stalingrad. The attacks made by the Russians on these positions were easily held, yet diverted forces from the main German purpose.

A speech made by Hitler on Sept. 30 proclaiming that Stalingrad would be taken was followed by intensified German attacks directed against the workers' settlements and the great in-



Stalingrad Battle. Sketch map of the industrial city of Stalingrad with its immediate environs. Here one of the key battles of the Second Great War raged September, 1942-January, 1943

Early in Nov. Hitler announced that his main objective had been achieved, that he would sacrifice no more lives in attacks, but would eliminate remaining resistance by bombardment. Fighting on a reduced scale continued, but there were no further violent German offensives. Russian small scale attacks on the Germans' defensive northern line continued through Oct. and Nov., but were not regarded by the Germans as serious. S. of Stalingrad, as well as inside it, the Russians had been pushed back on the river, and appeared to have no room to develop a serious attack. While the Germans were concentrating on the

reduction of Stalingrad, however, the Russians, some 35 m. upstream from Kletskaya, established a bridgehead at Serafimovich, against the Italians; S. of Stalingrad they succeeded also in greatly reinforcing their troops without German

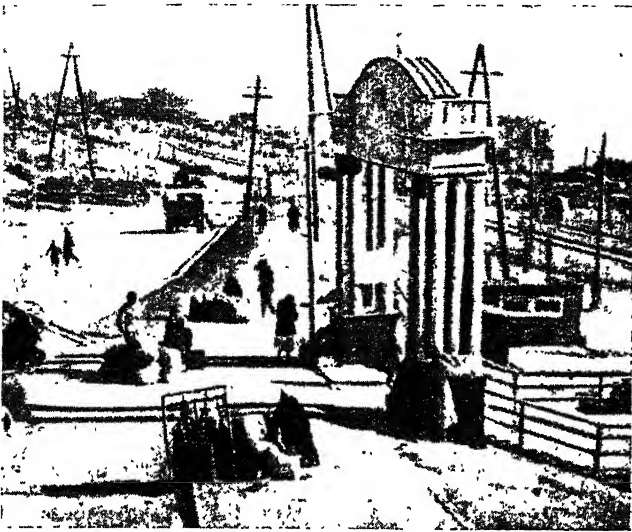
knowledge. They also assembled new armies E. of the Don, ready to go into action when that river froze.

Marshal Zhukov, who co-ordinated a series of Russian offensive operations planned already in the summer and explained by Stalin to Churchill when he visited Moscow in Aug., 1942, attacked simultaneously N.W. and S. of Stalingrad on Nov. 19. By the 22nd one army, under Zhukov's immediate command, had advanced from Serafimovich and captured Kalach; a second under Col.-Gen. Vatutin had seized Abganerovo to the S.W. of Stalingrad. These advances cut the two rly. lines to the W. on which the Germans depended for supplies and reinforcements. A third army, under Col.-Gen. Rokossovsky, was attacking the fortified German positions N. of the city, and reached the outskirts of Stalingrad on Nov. 24.

By the beginning of Dec. von Paulus's German 6th army was surrounded and being pressed into an ever-diminishing space. The Germans began to send in supplies and bring out the wounded by air; and S. of Stalingrad, about Kotelnikovo, they assembled a powerful striking force under von Hoth which succeeded in driving back Vatutin's forces some 30 m. But the Russians counter-attacked on the flanks of the German corridor thus created; and by the end of the year von Hoth was in full retreat towards Rostov. Fresh successes to the W. by Zhukov and Rokossovsky cut off all further possibility of relief for Paulus's invested forces. Summoned to surrender on Jan. 8, 1943, Paulus refused. Intensification of the Russian attack split his forces into a number of groups which were pounded unmercifully by artillery at shorter and shorter range. On Jan. 27, by which time the remnants of the besieged German force had been squeezed into two pockets less than two miles deep, one in Stalingrad, one just to the N. of it, Rokossovsky's forces linked from the W. with the Stalingrad garrison under Gen.



Stalingrad Battle. Sword of Honour presented by George VI to the Russian people to mark British admiration for their valiant defence of Stalingrad



Stalingrad Battle. Archway erected on the west bank of the Volga to commemorate the limit to which the Russian defenders retreated

Roodimtsev, thus finally raising the siege of the city. Paulus, promoted F.-M. at the moment of his capture, and 24 generals were taken prisoner when the German h.q. in Stalingrad fell on Jan. 31. On Feb. 2 the group N. of the city was annihilated. In the final stand 195,000 Germans, the remains of an army that numbered 330,000 on Nov. 23, 1942, died or were taken prisoner.

The heroic defence of Stalingrad was the turning point of the war in Russia. The fanatical courage of the garrison could not have maintained it so long had it not been possible to bring in supplies and reinforcements across the Volga; and the conformation of the river banks—steep, and with ravines that could be used to shelter reserves and munitions—became increasingly important as the Russians were pushed back until eventually they held only a half-mile strip of the city along the river itself. The fact that the Russians did hold Stalingrad brought disaster to the German armies, which, first prevented from sweeping on through Caucasasia by the diversion of strength to the attack on Stalingrad, were in the end exhausted and driven into retreat. The admiration and gratitude of the West found a token expression in the sword of honour forged by order of King George VI on behalf of the British Empire and presented by Churchill to Stalin at Teheran in Dec., 1943.

Stalino. City of the Ukraine S.S.R., capital of Stalino region.

The former Yuzovka, it lies on the river Kalmus about 65 m. N.E. of Mariupol. On the Donetsk coalfield, it was before the Second Great War the most important industrial city of the Donetsk basin, with blast furnaces, rolling mills, and other installations. The Russians admitted its evacuation Oct. 26, 1941, after many days' heavy fighting against the Germans; with its liberation, Sept. 8, 1943, the expulsion of the Germans from the Donbas was completed. Pop. (1939) 462,000

Stalinsk. Town of the W. Siberian region of the R.S.F.S.R. The former Kuznetsk, it lies on the upper Tom river at the head of navigation 205 m. S.S.E. of Tomsk, with which it is connected by rly. A town of 3,890 in 1936, it had a pop. of 169,540 in 1939 with its development as the chief iron and steel centre in the Kuzbass (*q.v.*). Gold, precious stones, and other mineral products occur in the vicinity.

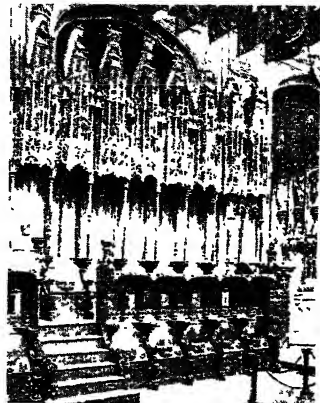
Stalk. Stem of a plant. (*See Botany; Plant.*) By analogy it is sometimes used for a stem of other kinds, *e.g.* a wine-glass. The same word, derived from an Anglo-Saxon root, also means to walk cautiously. One who pursues game in a stealthy way is called a stalker.

Stalky and Co. Book by Rudyard Kipling, composed of loosely connected short stories of school life. For both the school and the chief characters running through the stories the author drew on reminiscence of his

own schooldays. The school was the United Services College, then at Westward Ho!, N. Devon. The three chief characters, the occupants of "Study Number Five," were admitted portraits. "Stalky" was L. C. Dunsterville; "McTurk" was G. C. Beresford (who wrote *Schooldays* with Kipling, 1936, revealing how closely the stories were based upon fact); "Beetle" was Kipling himself. The book was published in 1899, but further Stalky stories were occasionally included in later books. *Consult* *An English School*, in Kipling's *Land and Sea Tales*, 1923.

Stall. Word with various meanings. One is for a division of a stable, in which a horse or other animal is placed. Another is for a bench or table, on which articles are exposed for sale in markets, and a third is for a certain class of seats in a theatre. The right of erecting stalls in market places is known as *stallage*.

In ecclesiastical architecture, a stall is an elevated seat in the choir or chancel of a cathedral or church. It is enclosed at the back and sides, high, projecting arms separating it from its neighbour. Rows of stalls for the use of clergy and choristers are usually arranged N. and S. of the choir. Extraordinary attention was lavished on the carving of stalls. There are 110 of them in Amiens cathedral, of carved oak, decorated with hundreds of figures, and the dark oak stalls of Henry VII's Chapel, Westminster Abbey, are noteworthy. The seat of a stall is hinged so that it can be folded against the back, and a device for the comfort of its



Stall. Part of Henry VII's Chapel, Westminster Abbey, showing the stalls of the Knights of the Bath, surmounted by their crests and banners; the lower seats are those of their squires

occupant is the Miserere (*q.v.*). Today the word is used in a figurative sense for the office of a canon residentiary in cathedrals and collegiate churches, *e.g.* Westminster Abbey. See Canon; Cathedral.

Stallion. Male horse kept for breeding purposes. The necessary characteristics of a stallion are size, substance, and a sound constitution. The best colours are brown, bay, or black. Another point is freedom from vice or nervousness, both these faults being hereditary in the horse. No one without a licence may keep a stallion of an age over that fixed by the minister of Agriculture unless it is a thoroughbred or a pony of a type prescribed by the minister, or was at least four years old when the Animals Act, 1948, came into force. See Horse.

Stalloy. Silicon-steel which has a low hysteresis loss. It is mainly used in transformers and similar electrical apparatus involving alternating magnetic fields.

Stalybridge. Mun. borough and market town of Cheshire, England. It stands on the Tame, which divides Cheshire from Lancashire, 7 m. E. of Manchester, and is served by rly. A trolley-bus service also connects the town with Manchester. The chief buildings

include the town hall and several churches. Mainly an industrial town of modern growth, Stalybridge has manufactures of cotton and calico goods and paper, engineering works, foundries, etc. It was made a bor. in 1857, and from 1867 to 1918 had its own M.P.; Stalybridge and Hyde is now the name of a co. constituency. Stalybridge owes its name to that of the family formerly owning the land and the fact of there being a bridge here. Its evolution from a small village began in 1776, when a cotton mill was built here. Market day, Mon. Pop. 24,831.

Stamen (Lat., a thread). Male organ of a flower, as the pistil is the female organ. There are usually several stamens, and may be many in each flower, and these are known collectively as the androecium. A stamen consists of a more or less slender stalk (the filament), and two anthers, which as a rule have two hollow lobes (thecae) united by the connective, which is a continuation of the filament. The thecae are filled with grains of pollen, which contain the male

gamete, and correspond to spores of ferns; the thecae split by definite lines or open by pores for the pollen to escape. If the filament is wanting, the anther is described as sessile; if attached by its entire length to the filament, it is adnate; if attached by its base only, it is innate; if the filament is connected to the middle of the back of the anther, the latter is said to be versatile. Where the stamens are aborted and have ceased to function as sex organs, they are known as staminodes. See Botany; Cell; Flower; Plant.

Stamford. Mun. borough and market town of Lincolnshire and Northamptonshire, England. It

stands on the Welland, 16 m. N.W. of Peterborough, with rly. stations. Of its existing buildings those of historical interest include churches of S. Mary and All Saints, both mainly of the 13th century, S. George and S. John the Baptist, both 14th century, and S. Martin, in which Lord Burghley (d. 1598) is buried. Browne's Hospital is a 15th century building, and other charitable foundations include the Burghley hospital and Snowden's almshouses. Besides a town hall, corn exchange, grammar school, and infirmary, there are remains of a Benedictine monastery founded in the 7th century, and the town had several other religious houses. The centre of an agricultural trade, Stamford has engineering works, breweries, and manufactures of wagons, farm implements, etc.

Stamford is said to have been the scene of a defeat of the Picts and Scots by Hengist in 449. One of the five boroughs of the Danes, it became a royal borough under Edward the Confessor and was soon a prosperous place. In the 12th century weaving was carried on, and there several fairs were held. The castle, which stood several sieges, was held by the Warenne family, 1206-1331. Stamford was made a corporate town in 1461. From 1295 to 1885

Stamford was separately represented in parliament; it now forms part of the co. constituency of Rutland and Stamford. Near the town is Burghley House, the town having been connected with the Cecil family since the 16th century. Market day, Fri. Pop. 10,910.

Stamford. City of Connecticut, U.S.A., in Fairfield co. It stands on Long Island Sound, 34 m. N.E. of New York, is served by the New York, New Haven, and Hartford rly., and is virtually a "dormitory" suburb of New York City. Industries include the manufacture of locks, typewriters, pianos, and hardware. Settled in 1641, Stamford was incorporated in 1830, and became a city in 1894. Pop. 47,938.

Stamford, EARL OF. English title held by the family of Grey since 1628. The earldom was granted to Henry Grey, grandson and heir of Sir Henry, 1st Baron Grey. The 1st earl of Stamford was lord-lieutenant of Leicestershire, and a prominent parliamentarian, his eldest son being one of the judges of Charles I. The 1st earl was succeeded by his grandson Thomas, son of the regicide, in 1673. Roger (b. 1896), who became 10th earl in 1910, was associated with public activities in Manchester, and was the first mayor of Altrincham in 1937-38.

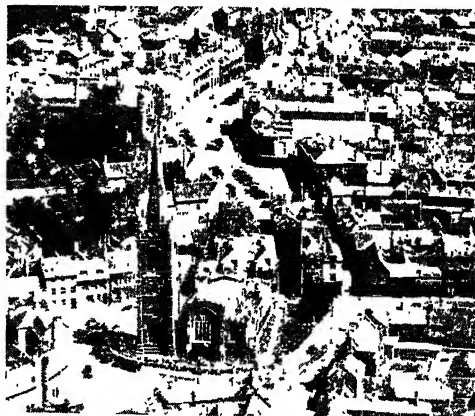
Stamford Bridge, BATTLE OF. Fought between the Norwegians under Harald Hardrada, and the English under their king Harold, Sept. 25, 1066. At the instance of Harold's brother Tostig, the Norwegian king had invaded England, and had landed near York. Meanwhile Harold, who was also expecting a Norman invasion, was collect-



Stamford arms



Stalybridge arms



Stamford, Lincs. and Northants. Air view of the town, with S. Mary's Church in the foreground

ing his army in the south. On Sept. 24 he reached Tadcaster, while his enemies marched out to Stamford Bridge, in the E. Riding of Yorks, 9 m. N.E. of York.

Harold having in vain offered generous terms to Tostig, and seven feet of earth for a grave to the tall Norwegian king, the battle raged for a good part of the day. At last the English broke through the Norwegian front, and Hardrada was killed. Reinforced from their ships, the Norwegians almost turned the day, but in the end the English prevailed.

Stamfordham, ARTHUR JOHN BIGGE, BARON (1849-1931). British soldier and court official. Born June 18, 1849, the son of the vicar of Stamfordham, he entered the Royal Artillery in 1869. He saw active service in the Zulu War of 1878-79, after which he left the army to become a member of Queen Victoria's household. In 1895 he was promoted to be her private secretary, and knighted, and after her death he served the prince of Wales, afterwards George V, in a like capacity. When the prince came to the throne in 1910, Sir Arthur Bigge remained his private secretary, and in 1911 was made a peer. He died March 31, 1931, and the title became extinct.

Stamford Hill. London district, N. of the met. bor. of Hackney (*q.v.*), with Stoke Newington W., and the Essex border on the E. It contains Clapton Common, 7½ acres, acquired for the public in 1872; Springfield Park, 32½ acres, acquired in 1903; and the Skinners' Company's school for girls, 1890. At Stamford Hill the lord mayor and corporation of the City met James I on his way to London in 1603.

Stammering. Defect of speech in which there is inability to pronounce certain letters or combinations of letters, or a tendency to stumble over syllables, transpose letters, or rapidly repeat letters (stuttering). The actual cause is lack of coordination between the various parts concerned in speaking. Stammering may be manifested in early childhood, or may arise later in life as a result of severe nervous shock, in which case it is a symptom of hysteria. The symptom was frequently seen in soldiers suffering from shell-shock. The nervous factor in stammering is also shown by the fact that normal persons under the influence of strong emotions, such as fright or rage, may stammer temporarily. Treatment lies in eliminating any physical cause, such as enlarged

tonsils, which may be a centre of irritation. Reading aloud, systematic exercises of the voice by those trained in the subject, and patient effort nearly always result in cure. *See Deaf and Dumb; Voice.*

Stamp, JOSIAH CHARLES STAMP, 1ST BARON (1880-1941). British administrator and economist.



1st Baron Stamp, British economist

Stamp was born June 21, 1880, and entered the civil service in 1896, being appointed assistant secretary to the board of inland revenue in 1916. He left the government service in 1919 to become a director of Nobel's Industries, Ltd. In 1925 he became president of the executive, and later chairman, of the L.M.S. rly., and joined the directorate of the Bank of England in 1928. Apart from these business activities, he held at various times many university appointments in economics and political science, having great influence on financial and industrial developments after the First Great War. In July, 1939, Stamp became economic advisor to the govern-

ment and prepared a survey of the government's war plans. A man of outstanding probity, he was raised to the peerage in 1938, and was killed in his London home in an air raid during the night of April 16-17, 1941. His eldest son, Wilfred Carlyle (b. 1904), killed in the same raid but presumed to have survived his father, was 2nd baron; his second son, Trevor Charles (b. Feb. 13, 1907), reader in bacteriology in London university, succeeded as 3rd baron.

Stamp Act. Act requiring stamps of varying values to be affixed to legal documents. In Great Britain an Act was passed by parliament in 1765, as a means of raising new revenue. It was provided that the Act should apply to the American colonies, but this extension aroused the bitterest opposition in the colonies, on the ground that it contravened the fundamental principle of the Bill of Rights, *viz.* no taxation without representation. The colonial resistance to the Act was so strenuous that in 1766 it was repealed, though parliament endeavoured to save its dignity by passing at the same time a Declaratory Act asserting its right to tax the colonies. *See American Independence, War of.*

STAMP COLLECTING AND COLLECTORS

Douglas Armstrong, Editor of Stamp Collecting

Cognate articles are those on Book Collecting; Chinaware; Coins; Furniture; Medals; Numismatics; Pottery

Stamp collecting is today the most popular of all collecting pursuits. It is sometimes known by the semi-scientific term of philately. Stamps have been collected almost since their introduction by Great Britain in May, 1840. The hobby has made its greatest strides since the 1920s. Collectors of stamps are now numbered by the million and are found in every civilized community. In England alone they are catered for by about 3,000 stamp dealers, while many governments maintain philatelic agencies for supplying the latest issues, from which they derive substantial revenues. Pioneer collectors were Dr. Gray of the British Museum, Sir Daniel Cooper, Judge Philbrick, Rev. J. E. Stainforth, and Mount Brown, who compiled one of the earliest catalogues in 1862. An open-air stamp bourse flourished in Brechin Lane, London, in the early 1860s, and in 1866 the stamp trade was first recognized by the London directory. Famous among early stamp dealers were E. Stanley Gibbons, W. E. Lincoln, P. L. Pemberton, and

W. Whitfield King. Stamp albums began to appear in 1862, and in the same year the first periodical devoted to stamp collectors, the *Monthly Advertiser*, was published, at Liverpool.

In just over a hundred years some 88,000 different stamps have been issued all over the world, 18,000 within the British Commonwealth, and 70,000 by foreign countries, exclusive of "varieties." Their number is increased by approximately 2,000 new issues annually. Most early stamps carried portraits of reigning rulers or heraldic devices. Not until the 20th century were pictorial designs introduced, covering a wide range of subjects from art to zoology, so that there is now scarcely a phase of human interest not represented on postage stamps. Historical and national events are frequently commemorated with special issues of stamps, such as the silver jubilee of George V (1935), the coronation of George VI (1937), the centenary of the postage stamp (1940), victory in the Second Great War (1946),

and the silver wedding of the king and queen (1948). Stamps have also been used extensively to raise money for charitable objects, like the Red Cross, by selling at a small premium over their face, or postal values. Special stamps for exclusive use on airborne correspondence form a large and popular group. The most important stamp collection ever formed was that brought together by Baron von Ferrari; this was dispersed by auction in Paris during 1921-22. It contained practically all of the rarest specimens and realized nearly £200,000. Twenty years later it was worth probably twice that. As a result of the increasing number of collectors, and uncertain financial conditions, stamp values have risen rapidly and rare stamps are recognized as a sound investment. The most important collection of stamps of the British Commonwealth was started by George V, who was a very keen philatelist; this was later continued by George VI. Included are many unique items in the way of artists' original drawings, proofs, and essays, as well as the finest known example of the 2d. blue Mauritius stamp of 1847, purchased for £1,450 in 1904 and now worth more than £5,000. The rarest stamp in the world, the 1 cent British Guiana of 1856, of which only one example exists, is valued by its present owner, an American collector, at some £10,000. The most valuable British stamp is the 10s. Edward VII issue overprinted "I.R.OFFICIAL" for departmental use. In mint, i.e. unused, condition, it was in 1948 catalogued at £1,750.

Before 1945 the finest public stamp collection was that in the Berlin postal museum. Next to it ranks the Tapling collection in the British Museum, containing more than 100,000 stamps issued before 1900, many of them of great value, and is estimated to be worth quite £150,000. The national stamp collection of the U.S. is housed in the Smithsonian institute at Washington, and there are many other valuable collections in the U.S.A.

Public exhibitions of stamp collections on an international scale are held every few years in one or other of the capital cities. London was the centre in 1890, 1897, 1906, 1912, and 1923. Societies of stamp collectors for mutual pursuit of the hobby number nearly 250 in Great Britain alone. At the head is the Royal Philatelic Society, London, founded in 1869, with the king as patron. Stamp exchange clubs are also numerous. London is the world centre of the stamp trade. The Strand (London) and Nassau Street (New York) have the largest number of stamp shops. Organized bodies for the promotion and pro-

stamp lovers of Britain, America and most European countries.

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Stamp Duties. Duties collected by means of stamps, which are bought and affixed to documents. In the U.K. they are collected by the inland revenue department. Duties on playing cards, etc., are

properly stamp duties, but the term is usually confined to those charged on the transfer of land, mortgages, insurance policies, bills of exchange, contract notes, and other documents by which property is transferred or privileges secured. Early in the 17th century the Dutch began to raise money in this way and soon England followed the example. The proposal to impose stamp duties on the American colonies led to the War of Independence. See United States.

Stamp Mill. Machine used for the fine crushing of mineral ore. It has been developed from the pestle and mortar. The mortar is a cast-iron rectangular box provided with a feed slot at the back and screens in the front. Usually five stamps, consisting of heavy stems with a steel shoe at the bottom, work in each box. These stamps are raised by means of cams, and, falling by gravity, crush the ore on the steel dies placed in the bottom of the mortar box. Shoes and dies are renewable.

Water flows through the mortar box to carry the crushed ore through the screens. Other accessories are ore feeders, to keep a supply of ore on the dies, and amalgamating plates or strakes, for mills crushing gold ores. This type of mill has been largely superseded by the rotary type of crusher.

Stanchester. Site of a Romano-British villa in Somerset, England. Situate 700 yds. E. of the parish



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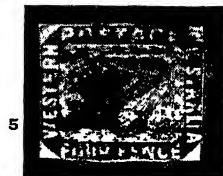
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Stamp Collecting. Some much prized specimens. 1. First postage stamp, Great Britain, May, 1840, penny black. 2. First colonial stamp, Mauritius Post Office, 1847, one penny, orange. 3. Rare shilling stamp of Canada, 1851, inscribed Twelve pence. 4. Three-cornered stamp from Cape of Good Hope, 1861, fourpenny blue. 5. Rare misprint, a fourpenny stamp of Western Australia, 1854, with inverted frame which makes the swan appear upside down

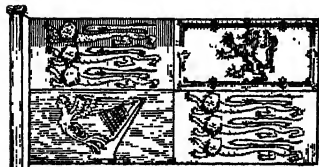
tection of philately are the British Philatelic Association, the Philatelic Traders' Society, and the American Stamp Dealers' Association. An international stamp bourse is held in London every year. Auction sales of postage stamps are conducted several times a week throughout the year, in London, and in provincial cities at frequent intervals. Their annual turnover has been estimated at close on a million pounds. The first stamp auction was organized by Sotheby's in 1872. The literature of stamp collecting is greater than that of any kindred pastime. Hundreds of books and thousands of periodicals in all languages have been published on the subject. A philatelic library bequeathed to the British Museum by the late earl of Crawford, in 1913, contained some 15,000 items, and was by no means complete. Weekly, fortnightly, monthly, and quarterly journals are published for the

church of Curry Rivell, it has yielded coins of Trajan, Antoninus Pius, and later emperors, Samian potsherds, bronze bits, etc.

Stanchion. Pillar, post, or strut supporting a load. A stanchion may consist of a single section, such as a rolled steel joist or angle, or may be a number of sections. Stanchions supporting very heavy loads are usually built up of rolled steel sections, riveted together or connected by bars or plates. *See* Strut.

Standard. Literally, that which stands. The word is used for a flag or other ensign of war, and also for shrubs and trees not supported by a wall, *e.g.* a standard rose. In another sense it means an established model or rule, *e.g.* a standard of living, or a uniform system of measurement (*see* Standardisation).

The royal standard or personal flag of the British sovereign measures 15 ft. by 7½ ft., and is em-



Standard. The British Royal Standard, comprising the arms of England, Scotland, and Ireland

blazoned with the royal arms in their proper colours. It must only be flown when the sovereign is present, or by his viceroys and the governors and lieutenant-governors of colonies and possessions. The queen consort, queen dowager, and other members of the royal family have a personal banner.

The standard borne by the household cavalry and by regiments of dragoon guards in the British army is of crimson silk damask, embroidered and fringed with gold, the tassels and cords of crimson and gold mixed. The lance, including the royal crest, is 8 ft. 6 ins. long. The flag is 2 ft. 5½ ins., without the fringe, and 2 ft. 2 ins. on the lance; the corners are square, and it bears the badge, devices, and mottoes conferred by royal authority for services in the field. *See* Colours; Eagle; Flag.

Standard, THE. Former London daily newspaper. It was established by Charles Baldwin in 1827 as a Tory evening paper. In 1904 the property was bought by C. A. Pearson. In 1916 the goodwill and copyright of the morning edition were offered for sale by auction, but withdrawn; publica-

tion was suspended after March 16, 1916. *See* Evening Standard, The.

Standard, BATTLE OF THE. Fought near Northallerton, Yorkshire, between the English and the Scots, Aug. 22, 1138. Under David I the Scots invaded England to support the cause of Matilda against Stephen. The archbishop of York and the bishop of Durham took the lead in collecting an army, which gathered around the banners of S. Cuthbert of Durham, S. Peter of York, S. John of Beverley, and S. Wilfred of Ripon. These were all fastened together on a pole and surmounted by a cross, thus giving to the battle its name. The English won.

Standard Bread. A bread made of flour containing 80 p.c. of the whole grain. An effort was made by the Daily Mail in 1911 to standardise the quality of the flour used for bread-making, whence the name for this particular form of bread. Standard bread was a light fawn in colour, and contained the whole grain less 20 p.c. of husks. *See* Bread.

Standard Cell. Cell used as a practical standard for the measurement of electro-motive forces. Such cells must be of a permanent nature, ensuring constancy of E.M.F. and also its variation with temperature. The two cells mostly used are the Weston and the Clark cells, the former being employed for preference owing to its smaller temperature coefficient. On no

became an important, if unspectacular, function of the central government. The metric system is a powerful and flexible instrument for standardised measurement, and is in general use among scientists, along with the British foot-pound-second system where this is particularly applicable. The standardisation of fundamental measurements is an important step in the development of science; and modern industry owes much to those who, like Lord Kelvin, invented instruments by which standardised measuring and testing became possible.

It is standardised measurement that makes possible standardised components and standardised qualities of components, *e.g.* the threads on screws. It would be impossible to overestimate the importance to engineering of the work done by Whitworth in Great Britain and Sellers in the U.S.A. in the standardisation of screw-threads: assimilation of the two systems was agreed in 1948. Standardisation of components covers bolts and nuts, wire, rivets, pipes, steel rods, girders, rails, electrical sockets, etc.

Each standardisation is itself a highly technical enterprise, which can be undertaken only by a committee of experts representative of the manufacturers and the users of the thing that is being considered. The committee issues a specification which may from

Name	Positive Pole	Electrolyte	Negative Pole	Depolariser	E.M.F. (volts)
Clark . . .	Mercury	Saturated ZnSO ₄	Zinc Amalgam	Hg ₂ SO ₄ and ZnSO ₄	1.4328 at 15°C
Weston	Mercury	Saturated CdSO ₄	Cadmium Amalgam	Hg ₂ SO ₄ and CdSO ₄	1.0183 at 20°C

Standard Cell. Comparison of the Clark and the Weston cells

account must such cells be connected as generators in a low-resistance circuit.

Standardisation. In industry, commerce, and science, the process by which uniformity of type, quality, size, shape, method, or statement is secured, to ensure greater exactness and certainty, and to avoid waste of all kinds.

The first phase of standardisation arose in the measurement of time, length, and weight. Some degree of standardisation of these existed in the ancient Egyptian and Sumerian civilizations. Throughout the Middle Ages attempts were made to standardise the measurement of cloth, etc. As industry and trade progressed, so the number of standard measures grew. Their maintenance

time to time be amended in the light of experience.

The standardisation of components may lead to the standardisation of fitments, *e.g.* electric switches, locks, and to the standardisation of methods of using things. For example, a "code of practice" was issued for the gas industry, stating what are believed by an expert committee of technologists to be the best ways of installing gas service pipes, gas lighting, hot-water supply by gas, gas-operated refrigerators, etc.

The chief agency of standardisation in this country is the British Standards Institution, which grew out of the earlier engineering standards committee and was incorporated by royal

charter in 1920. Its authoritative committees cover most of the industries of the country. It has issued some thousands of standard specifications, an index of which is contained in its year book. It is a non-profit-making concern, deriving its income from the sale of its specifications and from grants from the industries it serves. The B.S.I. maintains close relations with similar institutions in other countries. Its own standard specifications have a world-wide circulation and use.

Such specifications make it possible to express contracts with both brevity and precision, since it is necessary only to quote a B.S. number instead of describing the commodity or process in detail. They facilitate economy in manufacture by eliminating unnecessary duplication of types, and thus permitting mass production. They lessen the amount of stock that needs to be carried by traders.

Standardisation such as that organized through the B.S.I. does not involve standardisation of taste. It is based wholly on technological considerations. Individual manufacturers, however, tend more and more to standardise their products in order to secure the utmost advantage of mass production. Such standardisation calls for the highest skill in industrial design and production engineering, for mass production requires large-scale investments in machine-tools, etc.

Much standardisation of contracts, procedures, etc., has been organized by professional men, merchants associated in the produce exchanges, etc.

Standardisation of equipment played an important part in the cooperation of the Allied forces during the Second Great War, and is necessarily the subject of careful consideration in any defence plans relating to the future. See Sample; Units; Weights and Measures.

Standard of Living. Concept in economics, meaning the sum total of the goods and services available to an individual or a family or a social class. Strictly speaking, no two individuals have an identical standard of living. Standard of living is sometimes referred to as standard of life, standard of comfort, and real income or real wages (in contrast to money income and money wages, the value of which fluctuates with prices).

One's standard of living concerns things and services purchased

directly, *e.g.* accommodation, clothes, food, fuel, water-supply, entertainment, travel; things provided communally, and purchased to some extent indirectly through the payment of rates and taxes, *e.g.* protection, education, use of roads, parks, libraries, art galleries; and things available freely through one's location, *e.g.* sunshine, sea-breezes, or sea-bathing, enjoyment of scenery, etc. During the 20th century a very large proportion of the things constituting the ordinary person's standard of living has been provided communally.

An individual's standard of living is much affected by his capacity to get satisfaction from what is available, *i.e.* it is in large measure the result of his physical and psychological condition. Education, by changing that condition, may materially influence the standard of living that can accrue from a certain money income.

It can be misleading to relate standard of living too closely to money income, or to speak of the standard of living of an occupational group, *e.g.* farm workers, coal-miners; but the money incomes of such groups at different times are frequently compared, after adjustments have been made for price changes, to yield a rough indication of change in the standard of living. Thus, if at one time the average wage of farm workers is £1 5s. and at another time £4 5s., and if in the meantime prices have risen $1\frac{1}{2}$ times, so that £2 10s. will purchase only as much as could previously be bought for £1, the later standard of living (real wages) is roughly $\frac{4\frac{1}{2}}{1\frac{1}{2}} \times \frac{1}{2} \times 100$ p.c., *i.e.* 136 p.c.

of what it previously was. Too much reliance should not be placed on such comparisons, as they ignore many factors, and assume too great an ability to measure generally changes of prices. A more reliable indicator of changed standards of living could be obtained from the comparison of statistics of housing, consumption of food, clothes, electricity, transport, etc., and of deaths, births, marriages, diseases, etc., though such a comparison would be difficult.

Following the rapid rise of prices during the First Great War an attempt was made by the ministry of Labour in 1915 to furnish a basis for the adjustment of wages to compensate for price changes by the calculation of a

so-called "cost-of-living index number." After the Second Great War this was replaced by an interim index of retail prices. See Cost of Living; Sliding Scale. Consult Principles of Economics, A. Marshall, 1890; Economics of Welfare, A. C. Pigou, 1920; National Income and Outlay, C. G. Clark, 1937.

Standard Oil Companies.

American commercial organizations. For some years up to 1911 there existed a wide international combine known as the Standard Oil company of New Jersey. It possessed virtual monopolistic control. In 1911 the U.S. supreme court held that the company offended against the Sherman Anti-Trust Act, and dissolved it. The associated oil companies were thus separated into their component parts, becoming competitors and thus fulfilling the objects of the law. The chief Standard Oil companies are those of New Jersey, California, Ohio, New York, Indiana, Louisiana, and Pennsylvania. Other companies remaining from the split are the Atlanta Refining company, the Prairie Oil and Gas company, and the Vacuum Oil company. The largest is the New Jersey company, with a share capital of \$1,500,000,000. The break-up of the original Standard Oil company was the culmination of a prolonged political and legal battle, and of great legal importance as a standing precedent for future action against trusts.

Standard Temperature and Pressure (S.T.P.). The standard conditions under which volumes of gases are compared. These conditions are a temp. of 0° C. and a pressure of 76 cms. of mercury. An alternative term is normal temp. and pressure (N.T.P.).

Standard Time. Method of making time uniform over a given area. The units are belts or zones, 15° in width, because time changes one hour for each 15°. In each belt time is regarded as uniform, changes of one hour being made when another belt is entered. The corresponding system at sea is called zone time. See Time.

In the U.S.A. a system of standard times for different regions, in use on the 15s. since 1883, was established by Act of Congress in 1918. The country is divided into four zones: Eastern, Central, Mountain, Pacific. Each is approx. 15° of longitude in width. Their boundaries are decided by an interstate commerce commission. The time in these

zones is slower than Greenwich time by five, six, seven, and eight hrs. respectively. In Alaska there is a special standard time, ten hrs. slower than Greenwich.

Standerton. Town of the Transvaal, S. Africa. It stands on the Vaal river, here crossed by five bridges, at an alt. of 5,000 ft., 110 m. S.E. of Pretoria, with which there is rly. connexion. An agricultural centre, it is the chief town of the E. Transvaal. There are English and Dutch churches. Here the government started an experimental farm, and in the dist. cattle, sheep, and horses are bred. Named after a Boer, Adrian Stander, the place was made a municipality in 1903. On June 22, 1900, it was occupied by British forces. Pop. approx. 10,800.

Standing Order. In British parliamentary procedure, a resolution of either house made for the guidance and order of proceedings. Such orders regulate the procedure on bills, the sittings of committees, and other matters, and remain in force until repealed by the house. Many resolutions regarding procedure have become customary, and are thus equivalent in effect to standing orders. (See Parliament.) This is also a military term for permanent orders listed for the ordinary administration of a camp or barracks.

Standish. Dist. of Lancashire, England, forming part of the urban dist. of Standish with Langtree. It is 3 m. by rly. N. of Wigan. The main industry is coal mining, and rayon is made and food processed. The chief buildings are the church and Standish Hall where the family of Standish lived some 800 years into the 20th century. There are an ancient cross and stocks. Pop. 8,743.

Standish, MYLES OR MILES (c. 1584-1656). One of the Pilgrim Fathers. Born at Duxbury, Lanes, he sailed in the Mayflower for Plymouth, Mass., where the first New England colony was founded. Owing to his experience in the Netherlands, Standish was appointed commander of the Pilgrims, and successfully conducted several campaigns against the Indians. He died at Duxbury, Mass., Oct. 3, 1656. The subject of Longfellow's poem *The Courtship of Miles*



Myles Standish,
Pilgrim Father

Standish is the marriage of Priscilla Mullens to John Alden, who had endeavoured to secure her hand for Standish. *Consult* Lives, J. Abbott, 1898; T. Jenks, 1905.

Standpipe. Open-ended vertical pipe on the delivery of a pump. The column of water in the pipe prevents sudden rises in pressure by increasing its height during a delivery stroke. The top of the pipe must be above the highest point to which the water is pumped. *See* Hydrant; Pump.

Stane Street. Early English name for a Roman road in Sussex and Surrey. Traceable from Chichester for 9 m. straight to Bignor Hill, after some meandering it runs straight again for 18 m. from Hardham to Minnick Wood. Hence it passes through Dorking, Epsom, Clapham to Newington Causeway. *See* Britain and map, p. 1442; *consult also* The Stane Street, H. Belloc, 1913.

Stanfield, WILLIAM CLARKSON (1794-1867). British painter. Born at Sunderland, he was a sailor until 1818, and then became employed on scene painting in Edinburgh, and at the Royalty, Coburg, and Drury Lane theatres in London. The marine subjects he subsequently produced are fresh and true to nature, but somewhat monotonously cold in colour. They include Mount St. Michael, 1830; Portsmouth Harbour (by royal commission), 1832; Battle of Trafalgar, 1836. Elected A.R.A., 1832, and R.A., 1835, he died at Hampstead, May 18, 1867.

Stanford, SIR CHARLES VILLIERS (1852-1924). Irish musician. Born in Dublin, Sept. 30, 1852, he was a choral scholar of Queens' College, Cambridge, and made his reputation as organist of Trinity College, 1873-92. From visits to Germany he brought back classical works to receive their first performances in England. As teacher of composition at the R.C.M. from 1883 he was unsurpassed. He held the chair of music at Cambridge from 1887 until his death on March 29, 1924; conducted the Bach choir, 1885-1902;



Sir Charles Stanford,
Irish musician
Russell

and directed the Leeds festivals, 1901-10. In 1902 he was knighted. No class of composition was untouched by the versatility of Stanford, and if he sometimes shows skill rather than depth, it can be said that his Anglican church music was the most satisfying for at least a century; his settings of Newbolt's nautical poems, for solo singer or chorus, are wholly individual; the clarinet concerto, Irish symphony in F minor (1887), and five Irish rhapsodies for orchestra are firmly in the repertory. His most successful opera was *Shamus O'Brien*, 1896; *The Canterbury Pilgrims* was given in 1884, *The Travelling Companion* posthumously, 1926. There are *Lives* by J. F. Porte, 1921; H. P. Greene, 1935.

Stanford, LELAND (1824-93). American capitalist. Born at Watervliet, N.Y., March 9, 1824. he went to Wisconsin in 1849 and practised as a lawyer. Stanford's business career started in 1856 at San Francisco, and some years later he came to the front as a rly. magnate, and also as governor of California. He was a senator in 1884, and again in 1890, dying June 20, 1893. In memory of his son, he founded Leland Stanford Junior University (*q.v.*).



Leland Stanford,
American capitalist

Stanhope. Urban dist. of Durham, England. It stands on the Wear, 25 m. N.W. of Darlington, and has a rly. station. The chief industries are connected with the lead, ironstone, and limestone quarries. The church dates largely from the 13th century. The living, one of the richest in England, has been held by several men who attained eminence, including Bishop Butler. In 1813, in some caves near here, the home and belongings of a family of the Bronze Age were discovered.

Stanhope, EARL. British title borne since 1718 by the family of the same name. This family, named from Stanhope in Durham, produced several famous men. Philip Stanhope, 1st earl of Chesterfield (d. 1656), had a younger son, Alexander, who was the father of James Stanhope, soldier and statesman, who in 1718 was made an earl. He receives a separate entry, as do the 3rd, and the 5th earls. The family seat is Chevening Park, Kent,

and an eldest son is called Viscount Mahon. (See Chesterfield, Earl of.)

James Richard Stanhope, 7th earl, was born Nov. 11, 1880, went to Eton and Magdalen College, Oxford, joined the Grenadier Guards, and succeeded to his father's title in 1905. After holding several junior offices he entered the cabinet in 1936 as first commissioner of works. He was transferred next year to the board of education, was first lord of the Admiralty 1938-39, and in Chamberlain's war administration was lord president of the council. During 1938-40 he was Conservative leader of the house of lords.

Stanhope, JAMES STANHOPE, 1ST EARL (1673-1721). English statesman and soldier. Born in



1st Earl of Stanhope,
English statesman

Paris, he was a grandson of the 1st earl of Chesterfield. Educated at Eton and Trinity College, Oxford, he became a soldier and served in Italy and Spain. In 1706 he was made minister at Madrid, and while the War of the Spanish Succession was raging he acted as both diplomatist and soldier. In 1708 he was chosen commander-in-chief, taking Port Mahon, but after some considerable successes he was defeated by the French in 1710 at Brihuega and taken prisoner. In 1701 Stanhope had entered parliament, and when he returned from Spain in 1712 he became prominent as a Whig politician. Having helped to bring about the accession of George I, he was made a secretary of state in 1714. As first lord of the treasury in 1718 he effected the Quadruple Alliance with France, Austria, and Holland. He died after an apopleptic fit, Feb. 5, 1721.

Stanhope, CHARLES STANHOPE, 3RD EARL (1753-1816). British politician and inventor. Born in London, Aug. 3, 1753, son of Philip, 2nd Earl Stanhope, and educated at Eton and Geneva, he early developed scientific tastes. He took out various patents for steam vessels, and invented printing processes and instruments, including a method of stereotyping, and



3rd Earl Stanhope,
British politician
After C. Warren

a press known as the Stanhope press. He also evolved tuning instruments, a microscope lens, and calculating machines. After six years in the commons, Stanhope succeeded to the peerage, 1786, and became prominent for his revolutionary activities. He was chairman of the Revolution Society, 1788, and so consistently opposed the war with France that he was known as "Citizen Stanhope." He died at Chevening, Kent, Dec. 15, 1816. See Printing.

Stanhope, PHILIP HENRY STANHOPE, 5TH EARL (1805-75). British historian. Born Jan. 30, 1805, he graduated from Christ Church, Oxford, in 1827, and entered parliament in 1830. Until his succession to the title in 1855 he was styled Viscount Mahon. An unwavering opponent of the Reform Bill of 1832, in 1842 he was instrumental in amending the law of copyright. His historical works are largely derived from rare sources. History of the War of Succession in Spain, 1702-14 (1832), was followed by History of England from the Peace of Utrecht to the Peace of Versailles, 1713-83 (1836-53). His Life of William Pitt, 1861-62, is a standard work. He died Dec. 24, 1875.

Stanhope, LADY HESTER LUCY (1776-1839). English traveller. Born at Chevening, Kent, March



Lady Hester
Stanhope
After W. Wright

12, 1776, she was the eldest daughter of the 3rd Earl Stanhope. She went in 1803 to keep house for her uncle, William Pitt, over whom she acquired a remarkable ascendancy. On his death in 1806 she received a pension of £1,200 a year, but finding private life insupportable she left England in 1810 with a small entourage, and by 1813 had settled among the Druses, in a lonely villa about 8 miles from Sidon, on Mt. Lebanon, in Syria. There she lived until her death, June 23, 1839, in a quasi-Oriental style, surrounded by obsequious servants and exercising a sort of dominion over the neighbouring tribes. *Consult* Memoirs, 1845; Travels, C. L. Meryon, 1846; Life, J. Haship, 1934.

Stanhope Medal. British civil award. It is presented by the Royal Humane society for the bravest deed of attempted lifesaving of the year, either afloat or ashore. The medal is gold and bears on the obverse the effigy of a boy blowing on an extinguished torch to illustrate the accompanying motto: *Lateat scintillula forsan* (perhaps a little spark may yet lie hid). The reverse carries a civic wreath and the inscription *Hoc pretium cive servato tulit* (he obtained this award for saving a citizen). When it is presented for an unsuccessful attempt to save a life, the inscription is altered to *Vita periculo exposita dono dedit societas regia humana* (the Royal Humane Society presented this to—who exposed his life to danger). As a civil decoration, the medal is worn on the right breast, and is suspended from a light blue ribbon with outer stripes of dark blue and inner stripes of yellow. It is attached to the ribbon by a bar inscribed Stanhope Medal.

Stanislas I (1677-1766). King of Poland. Born at Lemberg (Lvov), Oct. 20, 1677, the son of



Stanislas I,
King of Poland

R a p h a e l Leszczynski, he was made palatine of Posen by Augustus II. When Charles XII of Sweden declared war against Poland, Stanislas was elected a representative at the congress of Warsaw, 1704. Charles supported his claims to the throne, and he was crowned, Oct. 7, 1705. He was forced to flee to Bessarabia in 1712. In 1725 Louis XV of France married Mary, Stanislas's daughter, and supported his claim to the Polish throne. Russia, however, besieged Stanislas in Danzig (1734), and, French help being late and insufficient, Danzig capitulated. By the treaty of Vienna, 1738, he renounced the throne of Poland, although permitted to keep the title of king. He was compensated with the duchies of Bar and Lorraine. Stanislas wrote *Oeuvres du Philosophe Bienfaisant*, 1764, and died Feb. 23, 1766.

Stanislas II (1732-98). King of Poland, born Jan. 17, 1732. A son of Stanislas Poniatowski, he became attached to the English embassy in St. Petersburg, where he was one of the lovers of the empress Catherine. In 1764 she secured his election as king of Po-

land. His reign saw the inauguration of economic reforms, but he was powerless to resist the partitions of his country. Stanislas was compelled to abdicate in 1794, and his last years were spent in prison in St. Petersburg, where he died Feb. 12, 1798.

Stanislavov (Pol. Stanislawow, Ger. Stanislaw). Town of Ukraine S.S.R. It lies near the Bistrizta, in a fertile plain, 75 m. S.E. of Lvov. During 1915-17, when it lay in Austrian Poland, it was the scene of conflicts between Austrians and Russians. In the area conquered by Poland, 1919-20, it was in Russian-occupied Poland after the Russo-German partition of 1939, was lost to Germany, 1941, recaptured July 27, 1944, and ceded to Russia under the Russo-Polish treaty of Aug., 1945. It made machinery and leather goods, and had a trade in flour, grain, and tobacco. The town gives its name to an administrative region. Pop. approx. 60,000.

Stanislavsky, CONSTANTIN (1863-1938). Russian theatrical director. Constantine Sergeevich Alexeev was born in Moscow, Jan. 18, 1863, went early on the stage, and produced plays for a society of art and literature. With Danchenko in 1898 he founded the Moscow Art Theatre, the opening production being *The Seagull*. A pioneer in the methods of modern "group" production, he made naturalism in his theatre of paramount importance. Rehearsals sometimes lasted a year. While he acted with success, his reputation rested on his genius as a director. After the Revolution, when the theatre was influenced by Communist doctrine, Stanislavsky in 1922 took his company on a two years' tour of European capitals. He was awarded the order of the Red Banner in 1933, and died Aug. 7, 1938. The 4th ed. of his autobiography, Eng. trans. J. J. Robbins, appeared in 1947.

Stanley. Urban dist. of Durham, England. It stands in a colliery district, 8 m. N.W. of the city of Durham. Pop. approx. 50,000.

Stanley. Urban dist. of Yorkshire (W.R.), England. It is 3 m. N. of Wakefield, and has a rly. station. It stands in a colliery district and has manufactures of rope and bricks. Pop. 16,090.

Stanley. Seaport of Tasmania. It is situated on the N. coast in the municipality of Circular Head, and has connexion by motor and rly. (167 m.), and by steamer with Launceston, and by steamer with Melbourne and Sydney. Pop. 620.

Stanley. Only town and administrative centre of the Falkland Islands. It is on the E. of E. Falkland, and has a good harbour, which was once a naval station. There are a wireless station and a government school. Pop. 1,246. See Falkland Islands.

Stanley. Name of a famous English family of which the earl of Derby (q.v.) is head. It took its name from Stanley in Staffordshire, the original name having been Aldithley or Audley. The Stanleys moved to Cheshire, settling in Wirral, and there Sir John (d. 1414) made the family fortune by marrying a Lancashire heiress, Isobel Latham. Through her he obtained Knowsley, still the residence of the earls of Derby, and much of the land on which Liverpool now stands. Sir John was given the lordship of the Isle of Man by Henry IV. His grandson Thomas was made Lord Stanley in 1456. The latter's son Thomas (d. 1504) became earl of Derby in 1485, after helping his son-in-law, Henry VII, to win the battle of Bosworth. From the elder Thomas is also descended the branch now represented by Lord Sheffield, who holds the barony of Stanley of Alderley created in 1839. A barony of Stanley, which had been in abeyance since 1594, was revived in 1921 in favour of the countess of Loudoun. Stanley was also the surname of Lord Ashfield (q.v.).

Stanley, ARTHUR PENRHYN (1815-81). British divine. Born at Alderley, Cheshire, Dec. 13,



Arthur P. Stanley.
British divine

1815, the son of a future bishop of Norwich, he was educated at Rugby and Balliol College, Oxford, where his scholarship won distinction. A fellow of University College, he was ordained in 1839 and took a leading part in university life. In 1851 he was made a canon of Canterbury, and in 1856 professor of ecclesiastical history at Oxford. He travelled considerably, and in 1862 accompanied the prince of Wales to Palestine. From 1864 Stanley was dean of Westminster. In 1863 he married Lady Augusta Bruce (1822-76), daughter of the earl of Elgin, and he died July 18, 1881.

As an author, Stanley is best known by his *Lectures on the History of the Jewish Church*, 1863-76. He also wrote a *Life of*

Thomas Arnold, 1844; *Memorials of Canterbury*, 1855; *Sinai and Palestine*, 1856; *Memorials of Westminster Abbey*, 1865. His broad church views made him conspicuous; he was found favouring all liberal movements in theology and all efforts to open the Church of England to men of diverse views. *Consult* *Life and Correspondence*, R. E. Prothero and G. G. Bradley, 1893; A Victorian Dean, ed. H. Bolitho, 1930.

Stanley, SIR HENRY MORTON (1841-1904). British explorer. Born at Denbigh, June 29, 1841,



he was the son of John Rowlands, a grazier; his youth was passed in extreme poverty, and in 1859 he ran away to Liverpool and sailed to New Orleans,

Henry Morton Stanley

where he was adopted by a cotton broker named Stanley. In 1861 he joined the Confederate army and was taken prisoner next year at Shiloh. Then he transferred to the Federal artillery, was discharged on account of ill-health, served a spell in the navy, and drifted into journalism. In 1868 he accompanied Napier's expedition to Magdala as representative of the *New York Herald*.

The next year saw him embark on his life's work. Livingstone had been lost near Tanganyika, and Gordon Bennett, proprietor of the *Herald*, commissioned Stanley to find him. Stanley started from Zanzibar in 1871 with 3 white men, 31 native soldiers, and 153 carriers, and on Nov. 3 at Ujiji he greeted the lost explorer with the words, "Dr. Livingstone, I presume?" After three months Stanley returned alone to Europe and published *How I Found Livingstone*. In 1873 Stanley accompanied Wolseley's Ashanti expedition, which he described in *Coomassie and Magdala*, 1874, and then he set out on his second journey to Central Africa, sponsored jointly by the *Daily Telegraph* and the *New York Herald*. He occupied three years in crossing the continent, and not until Aug., 1877, did he reach Boma with a few survivors of his party. Through the *Dark Continent*, 1878, recounted his adventures.

Leopold II of Belgium persuaded Stanley to undertake a further

exploration of the Congo, whither he returned in 1879 to spend five years. Returning to Europe, he was entrusted in 1887 with the expedition to relieve Emin Pasha, who had been cut off in Equatorial Africa by a Mahdist rising. After some remarkable marches he succeeded in his main object, though some 400 of his company died; and discovered Ruwenzori and Lake Edward Nyanza.

Stanley returned to England, was naturalised, brought out in Darkest Africa, 1890, and sat as Liberal Unionist M.P. for N. Lambeth, 1895-1900. A final journey elicited his last book, *Through South Africa*, 1898. He was made G.C.B. in 1899, married Dorothy Tennant next year, and died May 10, 1904. Courageous, humane, and a brilliant organizer, he ranks with the greatest explorers. He was portrayed by Spencer Tracy in the film *Stanley and Livingstone*, 1939.

Bibliography. Autobiography, ed. by his widow, 1909; *Life and Travels*, H. W. Little, 1890; *With Stanley's Rear Guard*, H. Ward, 1891; *H.M.S., Explorer*, J. Wassermann, Eng. trans. 1932; *Life*, F. Hird, 1935; *The Remarkable Expedition*, Olivia Stanley, 1947.

Stanley, OLIVER FREDERICK GEORGE (b. 1896). A British politician. A son of the 17th earl



Oliver Stanley,
British politician

of Derby, he was educated at Eton and Oxford and was called to the bar in 1919, after serving with distinction in the First Great War. He entered parlia-

ment in 1924 as Conservative member for Westmorland, which he represented for 21 years. From 1945 he sat for W. Bristol. He was minister of Transport, 1933; of Labour, 1934, in which year he became a privy councillor; president of the board of education, 1935; of the board of trade, 1937. Early in 1940 Stanley succeeded L. Hore-Belisha at the War office, being replaced by Anthony Eden in May. His last post in the coalition government was at the Colonial office, 1942-45. In opposition he developed an incisive and witty debating manner.

Stanley, WENDELL MEREDITH (b. 1904). American biochemist. He was educated at Earlham College and Illinois university, and during 1930-31 held a research post in Munich. Returning to

America, he held positions at California, Harvard, Cornell, and Princeton universities during 1936-42, and did valuable research on the purification and isolation of enzymes and virus proteins, being eventually in charge of research on these subjects at the Rockefeller Institute, Princeton. In 1946 he and J. H. Northrop (*q.v.*) were jointly awarded half the Nobel prize for chemistry.

Stanley Pool. Lake expansion of the river Congo. About 25 m. long by 16 m. wide, it is situated N.E. of Léopoldville at the beginning of the longest navigable stretch of the river. It was discovered by Stanley in 1877.

Stanleyville. Town on the river Congo. It is situated at the farthest navigable point for steamers ascending the river from Léopoldville before the rapids, Stanley Falls, between Stanleyville and Ponthierville are reached. It is about 800 m. direct N.E. of Léopoldville, and is connected by rly. with Ponthierville, 78 m., where the Congo again becomes navigable. Stanleyville is the capital of the eastern prov. of the Belgian Congo.

Stannmore OR STANMORE MAGNA. Part of the urban district of Harrow, Middlesex, England. It is 13 m. N.W. of Euston by rly., and is a terminus of the Bakerloo line. A fast-growing residential district, Stanmore is pleasantly placed on the slopes of a hill which reaches 480 ft. and is crowned by Stanmore common. At Stanmore in the Second Great War were the h.q. of Fighter Command. Near the parish church of S. John the Evangelist, cons 1850, are the ruins of a church dating from 1632. Bentley Priory, named after a priory of Austin canons, has historical and literary associations.

Stannard, HENRIETTA ELIZA VAUGHAN (1856-1911). British novelist, who wrote under the pen-name John Strange Winter (*q.v.*).

Stannaries (Lat. *stannum*, tin). Term used for tin mines, especially those of Cornwall and Devon. For hundreds of years the tin mines of that region had their own laws, customs, and organization. They had a meeting on Hingston Down, and later had their own representative assembly, or parliament, wherein laws were passed. This met for the last time at Truro in 1752. The district had its courts, which dealt with matters affecting the mines, but this jurisdiction was transferred to the county court in 1896. See Cornwall; consult *The Stannaries*, G. R. Lewis, 1908.

Stannic Acid. One of the tin compounds. It exists in two forms, both solid, distinguished as stannic and metastannic acids, or as alpha- and beta-stannic acids. Stannic acid (H_2SnO_3) is prepared by adding calcium carbonate to a solution of stannic chloride. It forms a series of salts known as stannates. Meta-stannic ($H_2Sn_5O_{11}$) acid is obtained by the action of nitric acid on tin (*q.v.*).

Stannite. A complex sulphide of tin, copper, and iron. It is also known as tin pyrites, or bell metal ore. Stannite is found in small amounts in many tin deposits, but only in Bolivia does it constitute an important ore mineral of tin.

Stanovoi. Mountain range, or rather plateau, of E. Siberia. It is considered by some part of, by others separate from, the Yablonoi system on the W. It forms the watershed between the rivers that flow into the Arctic Ocean and the Pacific, and extends about 2,400 m. between the Amur river and Bering Strait.

Stans OR STANZ. Town of Switzerland, capital of Nidwalden. Situated at an elevation of 1,495 ft., 2 m. by rly. from Stansstad, its port on Lake Lucerne, it contains a Capucin monastery. Pop. 3,000.

Stansfeld, SIR JAMES (1820-98). British politician. Born in Halifax, Oct. 5, 1820, and educated at

University College, London, he became known as a speaker at Radical meetings. In 1859 he entered parliament as Liberal member for Halifax, and in 1863 he was made a lord of the Admiralty. A friend of Mazzini, he was while in office accused by the French govt. of complicity in plots against Napoleon III. Stansfeld resigned, but returned in 1866 as under-secretary for India, and in 1869 he was made financial secretary to the treasury, and in 1871 president of the poor law board. In 1872 he became the first president of the new local government board he had helped to set up. He was out of office from 1874, except for a few weeks in 1886, but remained in parliament until 1895. He was a prime mover from 1874 in the agitation which led to the repeal of the Contagious Diseases Acts (*q.v.*) in 1886. He died Feb. 17, 1898. His *Life* was written by J. L. and B. Hammond, 1932.



Sir James Stansfeld,
British politician

Stansgate, WILLIAM WEDGWOOD BENN, 1ST VISCOUNT (b. 1877). British politician. Born



Viscount Stansgate,
British politician

May 10, 1877, and educated at London university, he was Liberal M.P. for St. George's, Tower Hamlets, 1906-18, then for Leith until 1927. Having joined the Labour party, he was secretary for India, 1929-31, while representing N. Aberdeen, and he sat for Gorton, Manchester, from 1937 until raised to the peerage in 1941. Wedgwood Benn served as an airman in the First Great War, rose to air commodore, and in 1945-46 was in charge of the Air ministry. He had been the vice-president of the Allied control commission for Italy after her withdrawal from the Second Great War.

Stanton Drew. Village of Somerset, England. It is 7 m. S. of Bristol, and there are coal mines in the neighbourhood. It is famous for its stone circles, the largest being 168 ft. in diameter. These are probably Druidical.



Stanton Drew, Somerset. Stone circle, probably of Druidical origin

Stanza. Division of a poem. In regular metrical verse there will be a given number of lines arranged in a pattern, as regards syllabification, rhyming, etc., to form one stanza; and each stanza of the poem will probably have the same arrangement. Thus Gray's *Elegy* may be described as being in 32 four-line stanzas. *Strophe* is an alternative term, mostly applied to classical verse.

Stapeldon, WALTER DE (1261-1326). English divine, born Feb. 1, 1261, at Annery, Devon. Educated at Oxford, where he



Walter de Stapeldon,
British divine

held the chair of canon law, Stapeldon was elected bishop of Exeter, 1307. He devoted much energy and wealth to rebuilding the cathedral. In conjunction with his brother, Sir Richard, a judge, he founded Stapeldon Hall, Oxford (now Exeter College), for poor scholars from his diocese. Appointed high treasurer in 1319, he became unpopular as a close associate of Edward II, and was murdered by a mob in Cheapside, Oct. 15, 1326. See Screen illus.

Staphylococcus (Gr. *staphylon*, bunch of grapes; *kokkos*, berry). Micro-organism which receives its name from its appearance under the microscope. The cause of boils, carbuncles, etc., it may be kept in check by penicillin and the sulphate of drugs.

Staple (A.S. *stapul*). Word used in a number of senses. In engineering, it is a loop of iron or a piece of wire bent and provided with two points to drive into wood to hold a hook or pin. A similarly shaped piece of wire is used as a paper fastener. In mining, a staple is a shaft to join different levels.

Staple (O. Fr. *estaple*, mart; Low German *stapel*, heap or storehouse of wares). Originally a mart

foreign merchants who used their privileges to such purpose that outcry was raised from time to time by English traders. In 1353, under Edward III, was passed the Statute of the Staple, which, after providing that all staple goods should be brought to a staple town in England, declared that "they shall be exported by merchant strangers only, and not by the king's subjects, who are to take an oath not to hold any staple beyond seas." Moreover, the courts set up in the staple towns to settle disputes between buyers and sellers were made up of two Englishmen and four aliens, and this provision gave the foreigner yet another advantage over English competitors. See *Free Trade*; *Hanseatic League*; *Protection*; consult *The Germans in England*, I. D. Colvin, 1915.

Stapleford. Part of the urban dist. of Beeston and Stapleford, Notts, England. It stands on the Erewash, 6 m. W.S.W. of Nottingham, and is served by rly. It has a beautiful old church and a fine Anglo-Saxon cross. Lace is manufactured. Pop. 8,838. Another Stapleford is near Hertford, and was scheduled as a new town after the Second Great War, but the project was abandoned on investigation.

Staple Inn. Surviving relic of old London. It is on the S. side of Holborn, W.C., facing Gray's Inn Road. In ancient times a commercial centre, associated with wool staplers, whence its name, it was one of the inns of chancery from the time of Henry V until 1884, when it was purchased by the Prudential Assurance co. The front was restored 1886 to its original design, and the other buildings were reconstructed in 1937, only to be heavily damaged by a flying-bomb on Aug. 29, 1944. There is a Dutch garden. The hall, dating from 1581, with a hammer-beam roof, is let to the Institute of Actuaries. Johnson wrote *Rasselas* at a house in Staple Inn, which is described in Dickens's *Edwin Drood*. See *Holborn*; *Inns of Court*; consult also *Staple Inn and Its Story*, T. C. Worsfold, 1913.

Star, THE. London evening newspaper. Established by T. P. O'Connor (q.v.), Jan. 17, 1888, its circulation eventually reached more than a million daily. Independently radical, it specialises in outspoken leaders and features on social topics, its picture service, and its sport. "T. P.", editor during 1890-93, was succeeded by H. W. Massingham (q.v.). A. L. Cranfield became editor in 1941.

Star and Garter, THE. Name of a hotel which once stood on Richmond Hill, Surrey. The original building was set up by John Christopher in 1738. Rebuilt before 1780, it was taken, 1809, by Christopher Creak, once cook to the duke of York, and in 1822 passed to Joseph Ellis, under whom it became famous.

In 1858 the property was taken over by a company and a palatial structure erected. The terraced gardens were laid out in Italian style. The hotel figures in *Vanity Fair*. It was pulled down in 1919 to make room for a home for paralysed and permanently disabled ex-servicemen, opened 1924 by King George V and Queen Mary. See Richmond.

Star Apple (*Chrysophyllum cainito*). Evergreen tree of the family Sapotaceae, native of the



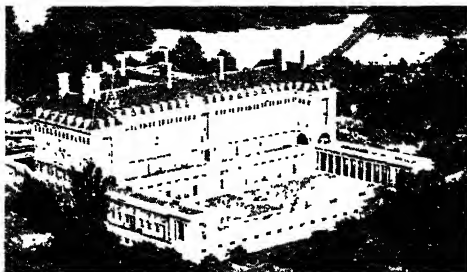
Star Apple. Spray of leaves and clustered flowers; right, fruit

West Indies. Its branches are clothed with rusty down, and the juice is milky. It has alternate, oblong leaves, covered with rusty hairs on the underside, and small white flowers. The edible fruit, like a large apple, is yellowish-green tinted with rose. When cut across the soft sweet flesh is seen to be divided into ten cells, each containing a seed.

Staraya Russa. Town of the R.S.F.S.R., in the region of Leninograd. It is on the slopes of the Valdai Hills, and is 36 m. S. of the city of Novgorod, and formerly possessed an imperial palace and a cathedral dating from 1701. Captured by the Germans about Aug. 20, 1941, Staraya Russa was the scene of fierce fighting and of the encirclement of their 16th army by the Russians during Feb., 1942.

This siege, however, was raised on April 24, and Staraya Russa subsequently became an important German base. It was liberated by the Russians, Feb. 18, 1944. Pop. 21,500.

Stara Zagora or **ESKI ZAGRA.** Town and co. of Bulgaria, in E. Rumelia. Situated on the S. slope



Star and Garter, Richmond. Air view of the Star and Garter home for disabled ex-servicemen, opened 1924

of the Balkans, it is about 50 m. N.E. of Plovdiv, with which, and with Burgas, on the Black Sea, it is connected by rail. It is a prosperous commercial centre, with manufactures of carpets, and is famous for its otto of roses. The co. has an area of 6,002 sq. m. and a pop. of 812,633. Town pop., 29,825.

Starboard. Right-hand side of a ship or aircraft, looking forward. Being on the starboard tack means having the wind on the right-hand side of a vessel. See Navigation; Port Side; Ship.

Star Catalogue. List of stars giving such data as their accurate positions in the heavens. The first catalogue of the stars was that of Hipparchus, formed 127 B.C., and contained just over 1,000 stars. In A.D. 138 Ptolemy produced the *Almagest*, in which were catalogues of stars in the N. and S. hemispheres, probably a revision of the catalogue of Hipparchus.

The more modern catalogues began with the appearance of the great comet of 1832, which attracted the attention of many photographers. Celestial photography was developed by the brothers Henry in Paris, and by them the first successful photographic refracting telescope was made. From this period dates the astrographic catalogue of the whole of the heavens, inaugurated in 1887 by a number of the world's observatories and in 1948 still in course of completion. See Stars.

Starch (M.E. *sterche*, stiffen). Constituent of plants which is both important and widely distributed. It is formed in the tissues by the action of chlorophyll under

the influence of light and is stored by the plant as a food reserve in stems (e.g., sago), tubers (e.g. potatoes), fruits (e.g. bananas), etc. Transfer to these storage reservoirs is effected by breaking down the starch in the leaves and green parts to sugars which pass through the cell walls and are reconverted to starch in the storage cells. The starch is thus available for use by the plant until it is sufficiently mature to produce starch itself.

The starch consists of oval-shaped grains built up of layers round a nucleus or hilum. The size varies from 0.004 to 0.14 mm. and under the microscope the size, shape, and arrangement around the hilum are distinctive and characteristic of the plant of origin.

Chemically the starches are polysaccharides—carbohydrates having the empirical formula $(C_6H_{10}O_5)_n$; the value of n is not known, but is more than 4. On heating with dilute acid starch is hydrolysed to sugars, dextrose, maltose, and glucose being the chief. Hydrolysis is effected in the plant by enzymes. This process is taken advantage of in the fermentation industries, the enzyme diastase being the active constituent of malt.

On heating to about 320° F. starch is converted to dextrin (British gum), a yellow powder soluble in water and much used as an adhesive.

MANUFACTURE. The process of manufacture is simple in the case of such materials as potatoes, which are comparatively free from gluten. The potatoes are disintegrated and washed with cold water on a sieve which permits the starch granules to pass, but retains the pulp. The starch granules settle, and fibres and impurities are washed away. After further washing the starch is dried, the final water content being about 17 p.c.

In rice the gluten is rendered soluble by treatment with dilute caustic soda. Wheat is reduced to a dough, the starch being separated by a roller that presses it through a fine screen from which it is removed by a water spray. Hard granules contain two polysaccharides, 10 p.c.—20 p.c. of amylose, which is soluble at 60°, and 80 p.c.—90 p.c. amylopectin, which forms starch paste with hot water. The gelatinising temp. of starch varies from 145° F. (potato) to 158° F. (sago).

Starch is used in industry for sizing yarn and cloth and thickening mordants and dye solutions in calico printing. In the laundry

trade it is used as a finishing agent. Large quantities of starch, chiefly potato starch, are used in the preparation of adhesives of the dextrin type. Various starches are used in the preparation of food stuffs and confectionery, particularly cornflour, arrowroot, tapioca, and sago; and in the natural state the starchy foods, e.g. potatoes, rice, constitute an essential part of the diet (see Carbohydrates).

T. Hedley Barry

Star Chamber, THE. English law court constituted by statute in 1487. It was used by Henry VII as an instrument for checking powerful nobles whose influence might exercise undue pressure upon the ordinary courts of law. The creation of this new body was a formal assertion of privileges of jurisdiction long claimed by the privy council, the officers of state who acted as judges being drawn from that body; and at first the star chamber was a beneficial body. Under the Stuarts, however, it became distinguished for its tyrannical procedure and the savage penalties it inflicted. It was abolished by Act of parliament in 1641. See Privy Council.

Starfish. Popular name for the class Asteroidea of the echinoderms, in which the body is ex-

posed of small suckers by means of which the animal crawls slowly along. The skeleton consists of small rods and plates of chalky material. The alimentary canal consists of a sac in the centre of the body, communicating with the mouth beneath and with a minute anus above. The food consists chiefly of marine bivalve molluscs, which the starfish gradually pulls open. It is very destructive to oyster and mussel beds. See Animal colour plate; Echinodermata.

Stargard (Pol. Starogard). A town of Pomerania in the part of Germany placed under Polish rule in 1945. It is on the Ihna, which is here navigable. 22 m. S.E. of Szczecin (Stettin). The Gothic church of S. Mary dates from the 14th and 15th centuries, and there is a 16th century Rathaus. Parts of the old town walls with gateways and towers remain. Stargard became a town in 1229, and was a member of the Hanseatic League. Pop. (1939) 32,545.

Starhemberg, ERNST RUEDIGER, PRINCE OF (b. 1899). Austrian politician. Born May 10, 1899, at Eferding, Upper Austria, descendant of a famous aristocratic family, he studied law at Innsbruck and Munich, served in the First Great War, fought against the Poles in Upper Silesia, 1920, and became leader of the unofficial home defence force (*Heimatschutz*) Upper Austria in 1928 and in all Austria in 1930. He was minister of the interior. Sept.-Dec., 1930, and vice-chancellor under Dollfuss 1934-35, and Schuschnigg, 1935-36, and leader of the anti-Nazi, anti-Socialist "fatherland front" until Nov., 1936. Forced to resign then, and emigrating when the Nazis invaded Austria in 1938, he served for a short time with the R.A.F., 1939-40, then as a French lieutenant, before disappearing to Argentina for the rest of the war. There he wrote a book, *Between Hitler and Mussolini*, and established claims upon liberated Austria, e.g. for the restitution of 13 Starhemberg castles and estates.

Stark, FREYA MADELINE. British explorer. Educated in Italy, at Bedford College, and the School of Oriental Studies, she travelled widely in Persia and the Middle East, and during the Second Great War served the ministry of Information in Aden, Cairo, Bagdad, and later in Canada and the U.S. Her travels were described in a series of books, including *Bagdad Sketches*, 1933; *The Valleys of the Assassins*, 1934; *The Southern Gates of Arabia*, 1936; *Seen in the Hadhra-*

maut, 1938; *Letters from Syria*, 1942; *East is West*, 1945; *Perseus in the Wind*, 1948. Her autobiography, *Traveller's Prelude*, was published in 1950.

Stark, HAROLD RAYNSFORD (b. 1880). U.S. naval officer. Born at Wilkes-Barre, Pennsylvania, Nov. 12, 1880, he was educated at the U.S. naval academy, and was commissioned in 1905. In the First Great War he served as aide to Admiral Sims, then held positions of increasing importance with the U.S. Fleet. From 1942 to 1945 Admiral Stark was commander of the U.S. naval forces in Europe. In 1943 he had much to do with the achievement of temporary agreement in N. Africa between the two generals, de Gaulle and Giraud.

Stark, JAMES (1794-1859). British artist. Born at Norwich, Nov. 19, 1794, he studied under John

Crome and at the R.A. schools. Although his art was hampered by ill-health, he became one of the most prominent painters of the Norwich group, painting woodland, river, and



James Stark,
British artist

coast scenery. His early life was passed in or near Norwich, but about 1839 he removed to Windsor, and in 1849 to London, where he died, March 24, 1859.

Stark, JOHANNES (b. 1874). German physicist. Born 15 April, 1874, at Schickenhof, Bavaria, Stark became professor of physics at the technical university of Hanover in 1906, Aix-la-Chapelle in 1909, at the university of Greifswald 1917, at that of Würzburg 1920, retiring in 1922 and going to live near Munich until 1933, when he was appointed president of the Physikalisch-technische Reichsanstalt at Berlin. A pioneer of theoretical atom physics, Stark discovered optical effects in 1905 and in 1913, those of the latter discovery being called after him, and gaining for him the Nobel prize for physics in 1919. His own theory concerning the nature of atoms was based upon what he termed "the axial effect of the emission of light" (1927), and his writings were mostly concerned with the spectra of atoms. As an active member of the Nazi party, connected with the German atomic experiments for war purposes, he appeared before a denazification court after the Second



Starfish. Five Fingers, *Asterias rubens*, the common starfish; top, Palms of placenta, or Bird's foot

tended into a series of rays or lobes producing the conventional star-shape. There are numerous species, distributed throughout the world, and several are common about the British coasts. The rays are in no sense limbs or tentacles. The mouth is situated in the centre of the underside of the body, and the rays are covered beneath with rows

Great War and was sentenced to four years in a labour camp.

Starley, JAMES (1831-81). British inventor. Born at Albourne, Sussex, April 21, 1831, the son of a farmer, Starley made his way to London in 1846, and while acting as a gardener devoted his attention to improving various mechanical devices round him. He joined a sewing-machine firm in 1855, and brought out a sewing-machine of his own invention in 1857. He turned his attention in 1868 to bicycles, and by the large number of his ingenious inventions, he succeeded in making Coventry, where he had settled, the centre of the bicycle trade. He died at Coventry, June 17, 1881. His nephew, John Kemp Starley, having entered the business, followed up these inventions and is regarded as the inventor of the safety bicycle, which was first shown at a cycle club show in Jan., 1885. *See* Bicycle.

Starling (*Sturnus vulgaris*). Name applied to numerous birds, but particularly to the common



Starling. Insectivorous bird, common in large flocks throughout Britain and Europe

W. S. Berridge, F.Z.S.

starling of Europe, a familiar British bird. It is about eight inches long, and has black plumage with green and purple reflections, the upper feathers being tipped with buff and the under tail coverts edged with white. The female has the plumage spotted below as well as above. Though not famed as a songster, the starling is remarkable for the variety of the notes that it utters, which often suggest imitations of fragments of the song of other birds. It is mainly insectivorous in diet, and spends much of its time on the ground probing for worms and grubs. The nest is composed of grass, twigs, and moss, and is placed in a hole in a tree or old building, or under the eaves of a house, and is used year after year. Starlings occur in large flocks,

which migrate from one district to another when food becomes scarce. *See* Bird; Eggs col. plate: Pastor.

Star of Bethlehem (*Ornithogalum umbellatum*). Bulbous herb of the family Liliaceae, a native of Europe. The scaly bulb is about an inch across, and the long, narrow leaves have a white stripe down the centre. The flower-stem branches above and bears from six to ten white flowers, an inch and a half across. The name is given to



Star of Bethlehem. White-striped, grass-like leaves, and clustered flowers of the bulbous herb

the star which guided the wise men to Bethlehem (Matt. 2).

STARS: THEIR NATURE & MOTIONS

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This Encyclopedia contains articles on the chief stars and constellations, e.g. Arcturus; Leo; Sirius. See also Astronomy and Astrophysics; Nebula; Planet; Sun; also Telescope, and the biographies of Copernicus; Galileo; Herschel; Lowell, P.; and other leading astronomers

The stars are heavenly bodies of a nature similar to the sun, intensely hot self-luminous globes, of dimensions far superior to the earth. The especial prominence of the sun is due to the fact that the earth is a member of its system; the other stars are isolated from us by vast distances. By analogy we may suppose that they are the centres of similar systems of planets. Some observational evidence of this for two of the nearer stars was obtained in 1943.

About 6,000 stars are sufficiently bright to be seen with the naked eye. The most powerful telescopes, aided by the photographic plate, reveal objects at least a million times fainter and the number of stars rises to thousands of millions. It is believed that further increase of light-grasp will not increase the total indefinitely, and that there is a definite system of the stars, limited in numbers and extent (*see* Galaxy). Other isolated systems still more remote in space exist in the extra-galactic nebulae (*q.v.*).

The configuration of the stars in the sky has not noticeably altered in historic times, but accurate measurements show that the positions are not absolutely fixed. In most cases a small displacement known as the star's proper motion can be detected. Of the bright northern stars Arcturus has an exceptionally rapid motion of 2.3 seconds per year; it was this star especially which led Halley to discover these movements in 1718. The motion of Arcturus is surpassed by that of a number of faint stars, the largest known being 10.3 seconds per year for a telescopic star in the constellation Ophiuchus discovered by Barnard in 1916. With this motion it would travel over the diameter of the full moon in 180

years. In most cases, the movements are very much smaller.

In general the nearest stars are likely to show the greatest apparent displacements, and much information of a statistical kind as to the distances and distribution of the stars has been obtained from a study of these motions. A very remarkable advance in our knowledge has been gained by the application of the spectroscope (*q.v.*) to measure the rate at which a star is approaching or receding from the earth. This radial velocity could not be found otherwise, since it makes no difference in the star's apparent position in the sky; moreover, the spectroscopic determination gives the speed in miles per second instead of in angular measure. The method depends on measuring the positions of the dark lines which appear in the spectra of stars; it is known that these must be displaced towards the violet or red end of the spectrum (*q.v.*) according as the star is approaching or receding. After a long period of unsuccessful attempts to apply this principle, practicable methods have been developed and great accuracy of measurement is now attained (*see* Doppler's Principle).

The Sun's Motion

By a study of the motions it has been found that the sun, carrying with it the earth and planets, is moving at a speed of 12 m. a second towards a point not far from the star Vega. This is the sun's proper motion and is quite normal for a star of its nature. Superposed on this motion is one of rotation, at about 160 m. per second, around the centre of the galaxy, some 30,000 light years away in the direction of the constellation of Sagittarius.

Not all proper motions are random; some examples of organized motion have been found, especially the "moving clusters" or groups of stars, often widely separated in the sky, which move with precisely equal speeds in parallel courses. A system consisting of five stars of the Great Bear with Sirius and some other rather bright stars is a good example of such a group.

For a few of the stars it is possible to measure the distances by a direct method known as parallax (*q.v.*) determination. The nearest known star is the bright southern star α Centauri, its distance being 25,000,000,000,000 m. This seems to be about the average distance which separates one star from its nearest neighbour. Other bright stars within a distance not more than three times as great are Sirius and Procyon. But, generally speaking, the brightness of a star is no clue to its distance.

If we could view all the stars from one standard distance, we should find a great diversity of brightness. There are some stars giving out 10,000 times as much light as the sun; others give only 1/10,000th of its light. The sun is about average in brightness.

It is possible in certain cases to "weigh" the stars, and it is found that they all consist of much the same amount of material; there must be very few stars indeed with masses outside the limits $\frac{1}{2}$ and 10 times that of the sun. The brightness depends mainly on the physical state; some stars have higher surface-temperatures than others, and consequently are more luminous; many of the stars are extremely diffuse globes having densities less than that of air.

Spectroscopic Observation

The nature of some of the substances contained in the stars can be ascertained by the spectroscope; in almost all cases the materials are identified as familiar terrestrial elements. The stars have been classified into various groups according to the spectra which they show. The presence or absence of the spectrum of a particular element must not, however, be taken to denote abundance or lack of that element; it is rather an indication of the temperature and other physical conditions, since special circumstances besides the abundance of the element are necessary to render a particular spectrum conspicuous. The spectral classes are therefore believed to denote, not fundamental differences of constitution, but different physical states of a star. There is a

recognized succession of these classes (called by the letters B, A, F, G, K, M), which is also the order of decreasing surface-temperature, from about 30,000° C. to 3,000° C.

The B stars are all intrinsically bright, but a cool red M star may be either a "giant" (about as bright as a B star) or a "dwarf" some 10,000 times fainter. The diameters of the stars can be inferred from their temperatures and luminosities. The red giants, which are highly luminous in spite of their low temperatures, must achieve this by radiating from very large surfaces. Betelgeuse, for example, has a diameter about 300 times that of the sun. On the other hand, the white dwarfs are faint stars despite their high surface temperatures: they must therefore be very small. The companion to Sirius has a diameter only 1/10,000th that of the sun. Since the masses of these stars do not differ by a factor of more than 15, it follows that their densities must differ enormously, from high-vacuum conditions in Betelgeuse to 40,000 times that of water in the white dwarfs.

Theoretical considerations indicate that the internal temperatures of the stars are very high: about 20,000,000° C. at the centre of a star like the sun. The stars are caused to shine for millions of years by the release of nuclear energy from the atoms subjected to these enormous temperatures.

Study of Double Stars

Many of the stars which appear single to the naked eye are found with the telescope to be double. In the great majority of cases the two components are found to be really associated and to share the same motion. By taking advantage of this knowledge it has been possible in some cases to "weigh" the two components. The period of revolution ranges from six years upwards. Even when a star is seen as a single point with the telescope, it is often found by the spectroscope to be alternately receding and approaching in regular cycle; it is fair to conclude that it must be revolving round another body of great mass. Thus many more double stars are revealed. These have comparatively short periods, sometimes less than a day, and the two bodies are separated by a space usually much less than the distance of the earth from the sun. Probably more than one-third of the whole number of stars are double.

Many stars vary periodically in brightness; these fall into at least three groups. (1) About 800 *Algol*

variables are known, which are simply double stars, in which the fainter component partially hides its companion once in each revolution, and so causes a decrease of light by eclipse. The best known example is *Algol*, which suffers an eclipse lasting nine hours every 3 $\frac{1}{2}$ days. (2) The *long-period variables* have a somewhat rough periodicity usually between 200 and 600 days. These show a much more marked fluctuation of light than the other classes. It seems that a great conflagration breaks out cyclically, so that the star gives 100 or 1,000 times more light than when quiescent. The variation seems to be inherent in the physical condition of the star, and may perhaps be analogous to the outbreak of spots on the sun which follows an 11-year cycle. (3) The *Cepheid variables* undergo a quick cycle of change, the period being a few days or a few hours. The change of brightness is small, and seems to be due to a regular pulsation of the star, the temperature falling and rising as it expands and contracts.

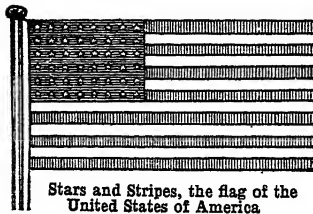
Notwithstanding the great variety of conditions in the stars and the vast distances between them, they must be regarded as units in one great process of evolution, and as associated in one great stellar system. This system has a flattened shape something like a lens, and the star clouds forming the Milky Way are coiled round in the same plane. It is possible that the whole system resembles one of the spiral nebulae which have been discovered in great numbers by methods of stellar photography.

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Stars and Bars. The flag of the Confederacy in the American Civil War. It consisted of three bars of red, white, and red, in a blue canton containing white stars to the number of the seceding states, arranged in a circle.

Stars and Stripes. Popular name for the flag of the United States of America, also known as "Old Glory." Hence The Star-Spangled Banner (*q.v.*), now the national anthem of the U.S.A. It is now composed of seven horizontal red stripes and six horizontal white stripes (which represent the original 13 states seceding

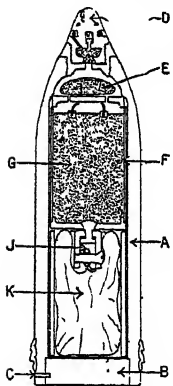
from the British crown), and a blue canton with 48 stars, in six rows of eight stars. In June, 1777, the flag had only 13 stars, but it was later



Stars and Stripes, the flag of the United States of America

decreed that a star should be added for every new state admitted to the Union. In the first type 12 stars were arranged in a circle with the 13th placed in the middle. In 1818 they were grouped to form a large star of five points. Then they were placed in rows, to form diagonal lines, but in 1819 the horizontal and perpendicular alignment was adopted. See United States.

Star Shell. Artillery projectile used for illuminating positions at night or for signalling. The shell



Star Shell. Sectional diagram showing filling. See text

is similar in construction to that used for shrapnel, but instead of a destructive filling contains a cardboard or varnished paper cylinder filled with a mixture of powdered magnesium and barium nitrate, and attached to a folded parachute. The diagram illustrates the most common type. The shell body, A, has a loose base, B, held in position by pins, C, above which is a split steel cylinder surrounding the folded parachute, K, which supports the star, G, in the case, F, by means of the shackle, J. The open end of the case contains a priming composition in which are set igniting pellets with strands of quickmatch. A perforated bridge above the star supports the bursting charge of gunpowder, E. The fuse, D, ignites the burster, which fires the quick match and ejects the star through the shell-base, when the parachute is withdrawn, opens, and slowly falls with the burning star.

Star shells were extensively used in the trench operations of the First Great War, and by ships on patrol, but in the more mobile land fighting of the Second Great War they were superseded by the more effective parachute flare dropped from aircraft. See Flare; Illuminating Shell; Rocket.

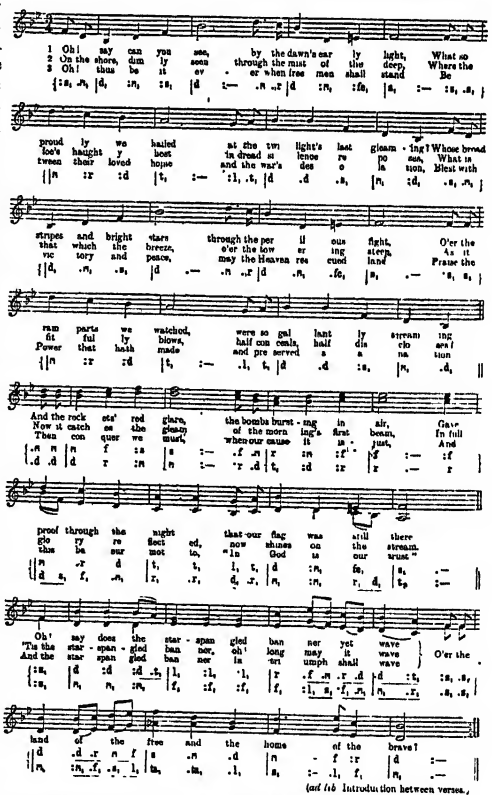
Star-Spangled Banner, THE. National anthem of the U.S.A., officially adopted as such in 1931. During the war in 1814, Francis Scott Key, a Baltimore lawyer, solicited under a flag of truce the release of a friend captured by the British. As an attack by the English fleet upon Fort Mifflin was then pending, Key was temporarily detained during the night. The attack failed, and in the morning the Stars and Stripes still waved above the fort. Moved by patriotic fervour, Key wrote some verses, afterwards published in The Baltimore American.

Its unusual metre was no doubt adopted on account of the popularity of an air to which several patriotic songs had already been fitted in America, viz. To Anacreon in Heaven, composed about 1771 by John Stafford Smith for the Anacreontic Society, a convivial club which met at a London tavern. Attempts to claim the tune as of American origin were overthrown by Oscar Sonneck in his monograph on the subject written for the library of congress. See National Anthem.

Starter. Mechanism fitted to an internal combustion engine for starting it. The self-starter takes the form of an electric motor supplied with current from the accumulator or battery of the vehicle when the starter switch is closed. The drive from the motor shaft is by a pinion which is automatically brought into mesh with a ring of gear

teeth formed on the periphery of the engine flywheel. When the engine starts the pinion is automatically disengaged from the flywheel teeth. Engagement and disengagement of the pinion are brought about by mounting it on a screw thread on the motor shaft, so that it can move axially along the shaft. On pressing the starter switch the motor begins to spin, but the inertia of the pinion causes it to lag behind, and so move along the shaft, engaging the flywheel. When the engine fires, the greater rotational speed imparted to the pinion by the flywheel causes it to move axially along the shaft out of engagement.

Aircraft piston engines are commonly started by electric motors as are other I.C. engines. Alternatives are the inertia and the cartridge starter. In the former a small free flywheel, electrically energised, on reaching high r.p.m. is engaged with the engine crankshaft through a clutch and gearing. Cartridge starters in large or small aircraft engines (and on marine and stationary Diesel engines) are



Star-Spangled Banner. Music for the voice part of the national anthem of the U.S.A.

By courtesy of Novello & Co., Ltd.

in the form of a revolver breech, loaded with cartridges resembling those for a sporting shot-gun. On firing by remote control from the cockpit the charge is ignited and the gas pressure depresses a small piston in the mechanism which, via a helical coupling, turns a starter shaft which is dogged to the main crankshaft.

For aircraft gas turbines, owing to the high inertia of the rotating unit and the need for a long period of acceleration up to about 3,000 shaft r.p.m., large electric motors are generally used, the engagement, disengagement, fuel injection, and ignition all being part of an automatic starting cycle.

Starting Handle. Detachable cranked handle for imparting initial rotation to an internal combustion engine by manual means. The ratcheted teeth on its shaft are made to engage with corresponding teeth on the forward end of the crankshaft, and a clockwise motion is imparted until the engine fires, when the handle is at once forced out of engagement. See Internal Combustion Engine.

Starvation (A.S. *steorfan*, to die; *sterfan*, to kill). State of exhaustion due to prolonged lack of food. It may also occur in animals supplied with improper forms of food which they cannot assimilate. In infants, emaciation follows, and rickets or scurvy may develop. Partial starvation is used by physicians as a method of treatment in some conditions, either to rest the gut or in cases of diabetes or obesity. Diseases which interfere with the taking or assimilation of food, such as cancer of the gullet, lead to death from starvation. Abrupt and complete deprivation of food, as in entombed miners, leads to death much more rapidly than the gradual deprivation of food. If both food and water are withheld, life is not likely to be prolonged for more than 8 or 10 days. If water is available, life may be maintained for six weeks, and longer periods are recorded. In a person deprived of nutriment, the craving for food passes off in a few days, but pain and sensations of distress are felt in the epigastrium. Emaciation and weakness supervene. The chemical processes of the body are completely altered, with the formation of poisonous substances. The temperature may be sub-normal. Hallucinations and delirium precede death. See Diet; Hunger-strike.

Stassfurt. Town in the Magdeburg dist. of the *Land* of Saxony-

Anhalt, E. Germany. It stands on the Bode, 20 m. S. of Magdeburg. The principal building is S. John's church, a 16th century building. The chief industry is mining for salt, the town having extensive mines of rock salt, and the richest deposits of kainite (potassium and magnesium sulphate) in the world. Stassfurt existed in the Middle Ages, and was once a fortified town. Pop. (with the connected town of Leopoldshall) 30,000.

Statant (Lat. *stare*, to stand). In heraldry, an animal standing in profile is said to be statant, unless of the deer tribe, when it is described as "at gaze." See Heraldry colour plate.

State. Modern name for the body politic, "a people organized for law within a definite territory." The word means literally a *standing*, something set up or established; that something is the body in which is vested the force of the community, so that it can be "organized for law." Within its territory the state must be free from external control, i.e. it must have sovereignty within its boundaries.

A state is not the same as a nation. The U.K. and the British colonies constitute one state but many nations. Within the U.K. alone there are at least three nations. In a federal state, such as the U.S.A. or Australia, the same territory can form part of the federal state for certain purposes and a separate state for others.

The term state connotes both the government and the entire organization connecting that government with its individual subjects, and according to most theorists, the individual citizens as well. In its dealings with other states, however, a state acts only through its government and the agents of that government. In relation both to its own citizens and to other nations the state has some of the rights and duties of a legal person, e.g. it can own land and can sue and be sued in courts.

In the organization of any state it is possible to distinguish three separate functions: the legislative, the judicial, the executive. The first is concerned with law-making; the second with law interpretation and enforcement; the third with government and continuous supervision, and with external relations. These functions may be vested in separate bodies, as in the U.S.A., where congress exercises the legislative function; the supreme court, the judicial function; and the president, the

executive function. Or they may be more or less closely combined, subject to certain safeguards, as in the British constitution.

There is much disagreement concerning the functions of the state, particularly the extent of the executive function. It is agreed that the primary duty of the state is to secure the maintenance of order within the area it controls, and to defend its subjects and their property against attack from without or within. Its judiciary has the duty of securing obedience to the law, and of judging disputes and settling claims when submitted to it by individual citizens. But in regard to the executive, opinions range from the view that it should restrict its activities to the maintenance of the minimum framework of government to the view that it should organize the economic and social life of the community in detail. The former view is the individualistic; the latter, the collectivist or totalitarian.

Two other fundamentally different views of the state exist. The one regards the state as an end in itself, an entity greater than the subjects, a creation that it is their primary function to serve; the other view is that the state is only a means of maintaining and increasing the well-being of the people composing it. The one considers the aggrandisement of the state as the highest good; the other judges the greatness of the state according to the degree in which it ministers to its people. It is impossible to reconcile these two theories of the state. The two Great Wars were essentially a conflict between them. See Society; Sociology; Sovereignty.

State Department. The most important executive department in the government of the U.S.A., created 1789. Its head, entitled the secretary of state, ranks first among the members of the president's cabinet, and in the event of the death of both president and vice-president would succeed to the presidential office. He is sometimes called the American premier. The functions of the department correspond mainly to those of the British foreign office, but include also many other routine duties, e.g. the secretary of state is keeper of the great seal, which he attaches, together with his own signature, to all presidential proclamations and to the commissions of a large number of officers appointed by the president. He is moreover required to receive,

record, publish, and preserve all bills, orders, and resolutions passed by congress. The roll of secretaries of state includes many of the most famous names in American political history. The department is housed in the great State, War, and Navy building near the White House, Washington, D.C.

Staten Island. Island of New York, U.S.A. Coterminous with the co. and bor. of Richmond, New York city, it is situated at the mouth of the Hudson river, and is separated from Manhattan Island by the Narrows, the communicating channel of upper and lower New York bays. It covers an area of 70 sq. m. Villages, some built in colonial times, line the N. and W. shores. Behind are shipbuilding yards and industrial plants. The W. portion has many large market gardens. Pop. 174,441.

Staten Island (*I. de los Estados*). Island off the S.E. point of Tierra del Fuego, Argentina. It is rocky and mountainous and has a length of 45 m. Le Maire Strait separates it from King Charles's South Land. A lighthouse marks its E. extremity and an observatory is situated on New Year Island, 5 m. off the N. coast.

Stater (Gr., from *histanai*, to weigh). Name of standard gold and silver coins, current in the ancient Greek world. Of gold staters, the oldest were probably the double staters of Cyzicus and Phocaea, the value of which was low, owing to debasement of the coinage. The double stater of Lydia, first issued by Croesus, was purer. The Persian gold stater, called a daric after Darius, weighed two drachmae, and was current at Athens, where, as well as in Macedonia, staters which were of the same value were coined. Their value was about £1 2s. Silver staters or didrachms, worth a tenth of the gold staters, were coined in Asia Minor and Greece. See Drachma; Numismatics.

State Rights. Political doctrine in the U.S.A. It declares that each component state of the Union is a sovereign body in itself, and that the federal government has no power other than that expressly delegated to it by the individual states. The doctrine manifested itself in practical politics on several occasions in the decades immediately following the Declaration of Independence. The most serious case was that of South Carolina in 1832, which declared null a tariff measure of congress. That issue was compromised; but the whole matter

was subsequently brought to a head by the slavery question, which divided the South from the North, when the Southern states took up arms in the Civil War (1861-65), ostensibly to vindicate their right to secede from the Union, the logical outcome of the doctrine of state rights. The North, on the other hand, fought successfully to maintain the "Union one and indivisible," an object which involved the absolute negation of the state rights doctrine. The Civil War settled the matter for practical purposes. The doctrine is fully discussed in Bryce's *American Commonwealth*. See United States.

States-General. Body representing the three estates of the French kingdom, the clergy, the nobility, and the commons. It was first called by Philip IV in 1302 to secure for himself popular support in his struggle with Pope Boniface VIII. The states-general had no legislative functions and could make their influence felt only by petitioning against grievances. Theoretically their consent was necessary for the imposition of general taxation, but they rarely met. Their criticism of the national finance when called by Louis XIII in 1614 led to their dismissal by that monarch, and they did not meet again until they were called by Louis XVI in response to general demand in 1789. It was decided that the clergy and nobility should be represented by 300 and the commons by 600 members, but when the members met, difficulties of procedure arose. Eventually it was agreed that all the deputies should meet and deliberate in a single chamber, which took the title of National Assembly (*q.v.*).

The term states-general was also applied to the representatives of the seven provinces of the old republic of the Netherlands (*q.v.*). This body met at The Hague and exercised sovereign power. The name survives in the parliament of the present kingdom of the Netherlands. See Representation.

Statice. Flowering plant of the family Plumbaginaceae, mostly growing on sea cliffs and mountains. It is the generic name of Sea Lavender (*q.v.*), and was formerly that of Thrift (*q.v.*).

Static Electricity. Electricity at rest, as contrasted with current or dynamic electricity. The phenomena concerned with static electricity are due to the electrostatic forces of attraction or

repulsion arising directly from the charges. See Electricity.

Statics (Gr. *statikos*, relating to standing). Branch of mechanics which deals with bodies and forces or systems of bodies and forces in equilibrium. One of the fundamental propositions of statics is that the sum of the moments of all the forces about any axis must vanish. The potential energy of a statical system is a minimum. Statics also treats of the relations of strains and stresses of a body. Many problems of statics may be solved by graphical methods. See Equilibrium; Graphic Statics; Mechanics.

Stationers' and Newspaper Makers' Company. London city livery company. Arising from



Stationers' Company arms

the Ancient Brotherhood of Text Writers, or Scriveners, it was incorporated as the Stationers' Company in 1557 to foster the publishing and stationery trades. Mary I and Philip granting its first charter. Still maintaining practical connexion with the trades named, it once had the monopoly of printing in England, and until 1912 works could be "entered" or registered for copyright purposes at Stationers' Hall under the Copyright Act, 1842. Until 1771 the company had the sole right to print almanacs. The site of the hall in Stationers' Hall Court, Ludgate Hill, was purchased in 1611; the present hall was built 1670-74 after the Great Fire, refaced with stone in 1800, and extended in 1887. It contains a stained-glass window in memory of Caxton. The company, in conjunction with Middlesex county council and Hornsey borough council, maintains a day grammar school for about 500 boys at Hornsey. There are a corporate income of £1,600 and a trust income of £3,100.

Stationery Office, HIS MAJESTY'S. Government printing and publishing organization. Established in 1786, it issues White papers, Blue books, books on a wide range of subjects, pamphlets of the various ministries, and periodicals to the public at home and abroad, and has a head office at 421, Oxford Street, London, W.1, and sales offices in London, Edinburgh, Cardiff, Manchester, and Bristol. Copyright in all British government documents is vested in the controller. The annual out-

put includes telephone directories, rationing documents, national savings certificates, pension and allowance books, and national insurance stamps. The London Gazette has been issued twice weekly since 1665, and the daily and weekly Hansard (*q.v.*) is also a publication of H.M.S.O.

Stations of the Cross. Popular name of a devotional practice in the R.C. Church. A series of pictorial representations of scenes in the Passion is usually placed on the walls of R.C. places of worship, and during Lent and in Passion Week the faithful proceed from one to another, kneeling and reciting appropriate prayers before each. The stations usually number 14. The devotion dates from 1726, when the indulgences to be gained by a visit to the holy places of Jerusalem were declared obtainable by visits to representations of the Stations of the Cross.

Statistical Society, ROYAL. Society founded in 1834, and incorporated by royal charter in 1887. Its object is the study of statistics of various kinds. During the session papers are read, and afterwards published in the society's journal. The offices are at 4, Portugal Street, London, W.C.2.

Statistics. Term for statements of facts expressed numerically and placed in relation to one another. Statistical analysis is the process of classifying these statements and clarifying those relationships which are relevant to the inquiry in hand. Although popularly associated chiefly with economics and other social sciences, statistical analysis can be utilised in any field of inquiry in which adequate numerical data can be collected.

Trained statisticians play an important part in business, in government, and in scientific research of all types. The usefulness of statistics has come to be gradually appreciated in business as the scale of operation has expanded so that it is beyond the capacity of any individual to grasp all the details of production and sales. For example, the village shopkeeper knows his customers and their individual requirements and thus needs only the simplest records in order to carry on his business. The manager of the multiple store, however, cannot himself know all the facts and requires numerical records which can be summarised and analysed in order to provide him with the data on which to base his decisions; in short, he requires statistics. Parallel developments in public

administration have led to a parallel dependence. In medieval times only the most primitive statistics were required for estimating the govt's revenue and expenditure in the limited field of activity with which govt. was concerned. The growth of trade and industry and the development of a scientific outlook on social and economic problems led to extensions in the fields in which statistics were collected and to refinements in the methods of analysis. Thus by the end of the 19th century most important countries had regular pop. censuses and steadily improving vital statistics, officially collected, as well as the customary records of finance and trade and statistics collected for special purposes.

Government Use of Statistics

The growth of govt. intervention in social and economic matters during the 20th century greatly enhanced the importance of statistics, for in the interests of good administration it became necessary to extend the field in which quantitative data are collected and to develop methods for estimating and measuring social phenomena with which the govt. is concerned. The problems arising from the Second Great War, together with the desire to plan economic activity to prevent violent fluctuations in employment, led to attempts to draw up budgets of all national economic resources (in addition to the traditional financial budgets of govt. revenue and expenditure) as well as in some cases budgets of international resources, *e.g.* in connexion with the European Recovery Programme. Much statistical analysis has been applied to such widely different subjects as research into the nature of matter and the application of scientific discoveries to agriculture.

The difficulties of collecting reliable data, of making estimates where data are seriously incomplete, and of selecting the most appropriate methods of analysis differ from inquiry to inquiry. Statisticians therefore require considerable background knowledge of any subject of inquiry before they can apply their techniques. Nevertheless, many of the problems and, also, of the fundamental methods of analysis are common to all. Certain preliminary processes are essential: definition of the universe to which the inquiry relates, definition of the limitations of the data available about that universe, choice of appropriate systems of classifica-

tion of the data, and classification and tabulation. However elaborate the later stages of analysis may be, failure properly to complete these elementary steps detracts from the reliability of the results and may lead to serious errors. To take a single example, in comparing the age composition of the pop. of Great Britain at two dates, care must be taken to compare the same universe at both times, *e.g.* aliens resident in Great Britain must be included at both dates or excluded at both dates; and identical, or comparable, systems of classification of ages must be used for both dates.

One of the most important functions of statistics is to find appropriate measures for describing data. For this purpose averages of various sorts and measurements of variation, or dispersion, about the averages are commonly used. These measures may be simple or complex according to the type of data and the information required. Once they have been calculated the statistician possesses a way of comparing the relevant characteristics of the data, *e.g.* the yield per acre of wheat on farms of different types.

Statistical Significance

Application of the theory of probability enables the statistician to decide whether the differences within a group, or between several groups, are statistically significant, in the sense of whether they are too large to be attributed to chance influences on the data. This technique is particularly important when the data collected relate only to a sample, or samples, of the whole universe to which the inquiry refers. In these cases the statistician can decide, by calculating the significance of variations within a sample, or between samples, whether the samples can be regarded as representative of the universe from which they are drawn. The analysis of samples is of fundamental importance in current statistical inquiries in the social sciences, business, and the natural sciences, as by it information can be obtained where it is impracticable to investigate the whole universe. The ministry of Labour's inquiry of 1937-38 into working-class expenditure provides a good example of the use of sampling technique.

Correlation analysis is used to measure possible relationships between phenomena, *e.g.* rainfall and wheat yields. A high positive correlation coefficient between high yields and high spring rain-

falls in different places, and low yields with low spring rainfall, would indicate that high yields tend to occur in places of high spring rainfall and vice versa. The greatest care has to be used in interpreting correlations, for they measure degrees of co-existence of occurrences rather than demonstrate causal relationships.

Statistical methods have also been evolved to analyse time series, i.e. records of data over periods of time, such as rainfall in some place over periods of days, years, etc. The main trends can be isolated from seasonal or random changes and may be used in some cases as a basis for forecasting. Analysis of time series is of particular importance for investigations of fluctuations of economic activity, and it is in this connexion that the technique of index numbers has been developed to provide summary measurements of economic changes.

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Statius, PUBLIUS PAPINIUS (c. A.D. 45-96). Roman poet. Born at Neapolis, the son of a well-known grammarian, he accompanied his father to Rome, where he became famous for his successes in the poetic competitions which were a fashionable event in that age. Apart from his gift of improvisation, Statius was a facile and accomplished versifier, ranking high among Latin poets of the Silver Age, and his works enjoyed a great vogue in the Middle Ages. The most notable of Statius's works is the *Thebaid*, an epic poem dealing with the war of the Seven against Thebes. Less known is a collection of miscellaneous poems, *Silvae*. Statius left Rome in chagrin at not receiving the prize in the Capitoline competition in 94, and returned to Neapolis, where he died.

Stator. Stationary part of an asynchronous (alternating current) induction motor. A stator carries the coils through which the primary current passes. *See* Current.

Statuary. In art, a sculptor who makes statues in the round. The term is generally used nowadays in connexion with the more

commercial types of sculpture, e.g. garden statuary. Statuary may also mean a collection of statues. *See* Sculpture.

Status (Lat., position). Term used in ancient legal systems to indicate the standing that a man had in law. Thus in Roman law the status of a free man and a slave, of a father and a son, of a citizen and an alien, were quite different. It is still used in a general sense.

Status Lymphaticus. Condition characterised by increase of the lymphatic tissues of the body and of the lymphatic glands. The thymus gland, an organ present in childhood which normally gradually atrophies as adult life is reached, is found to persist in the subjects of status lymphaticus. The spleen is also enlarged, and the heart very often, if not always, exhibits fatty degeneration. Persons suffering from this condition are often fat and flabby, but may not exhibit signs of ill-health. Such persons are bad subjects for the administration of an anaesthetic.

Statute (Lat. *status*, position). Literally, something fixed. It is used for a law enacted by a parliament or other legislative body. Many of the early laws of England are known as statutes, e.g. statute of labourers, statute of uses, etc. The practice was revived in 1931, when in order to mark the outstanding importance of the Act of parliament of that year which established "dominion status," the Act was called the Statute of Westminster. *See* Act of Parliament; Bill; Law.

Statute Law. Law made by the supreme legislative authority, e.g. an Act of parliament. There is no difference in force or effect between a statute and any other kind of law. According to the English rule, a penal statute must always be interpreted strictly, or narrowly; while a remedial statute must be interpreted broadly and generously. This rule only applies where the strict literal and grammatical meaning of the words is susceptible of two interpretations.

In Great Britain it is customary to pass, every now and then, a Statute Law Revision Act, the object of which is to repeal obsolete sections or words of old statutes, or such as conflict with more modern Acts of parliament.

Properly speaking, the Acts of any session of parliament constitute only one statute; and that is why every Act is numbered. Thus 9 and 10 Geo. VI, chap. 22, means the twenty-second chapter of the statute passed in the session

of parliament which began in the ninth year of the reign of George VI and finished in the tenth year. *See* Law.

Statutory Declaration. Statement made under the Statutory Declarations Act, 1835. Before that date it was necessary for many purposes of trade to make a large number of statements on oath. It was thought that this led to the oath being lightly regarded, and the Act enabled a declaration to be substituted for the oath, except in the oath of allegiance and in judicial proceedings. A person making a false statutory declaration is liable to fine and imprisonment for not more than two years.

Statutory Instrument. Document to which the Statutory Instruments Act, 1946, applies. The Act was passed as a result of a report of the select committee on statutory rules and orders, which recommended alterations in the procedure under which delegated legislation by order in council or a government department was controlled by parliament. The Act applies to all orders issued by any body to which power to legislate is delegated by parliament.

Staubach. Waterfall in Switzerland, in the canton of Berne. It is close to Lauterbrunnen, 8 m. S. of Interlaken. It drops 980 ft. from a jutting rock and is blown into a silvery veil of spray, whence its name "dust stream."

Stauning, THORVALD (1873-1942). A Danish statesman. He was born in Copenhagen, Oct. 26, 1873, and began work as a cigar sorter. In 1906 he entered parliament as a trade unionist and a Social Democrat, and from 1910 to 1924 led the Socialist party. Stauning then became prime minister for two years; he was again prime minister in 1929 and retained that office until his death, representing Copenhagen as M.P. He codified national insurance in 1933. In the First Great War he was thought to have had pro-German sympathies; in the Second he protested vigorously against the occupation of Iceland by Allied troops. On April 9, 1940, when the Germans delivered their ultimatum to the Danish government, Stauning advised its acceptance. He died in Copenhagen, May 3, 1942.

Staunton. City of Virginia, U.S.A., the co. seat of Augusta co. It is 133 m. W. by N. of Richmond, and is served by rlys. Bricks, flour, and agricultural implements



Stavanger, Norway. Air view of the city, showing some of the many islands in Stavanger Fjord

are manufactured. Founded in 1745, Staunton was incorporated in 1761, and chartered as a city in 1870. Woodrow Wilson was born in Staunton, and here in 1908 the commission form of government was first tried, the voters electing a council which appoints a city manager. Pop. 13,337.

Staunton, HOWARD (1810-74). British chess player and Shakespearian scholar. He defeated Fournie de Saint-Amant in a great chess match in Paris in 1843, and was for many years one of the best exponents of the game, beating such celebrated players as Popert, Horwitz, and Harwitz. Staunton was ultimately defeated by Anderssen at the London tournament in 1851. He wrote many standard works on chess, also edited *The Chess Player's Chronicle* and *The Chess World*. He published an edition of Shakespeare, illustrated by Sir John Gilbert, 1857-60, edited a facsimile of the first folio, 1866, and published a number of emendations of the text. Staunton died June 22, 1874.

Staurolite (Gr. *stauros*, cross; *lithos*, stone). A hydrated aluminum-iron silicate. A little magnesium and manganese are often present. So called from the cruciform twinned crystals which are a common form of the mineral, it has a brown vitreous lustre. It is widely distributed in metamorphic rocks, like gneiss, and is often associated with garnet, tourmaline, and syenite. In Tirol and Brittany twinned crystals were looked upon by the superstitious as having fallen from the skies, and were worn or carried as charms to ward off the evil eye.

Stavanger. City and seaport of Norway. It is 105 m. S. of Bergen,

190 m. S.W. of Oslo, on the Stavanger Fjord, an arm of the Bukke Fjord. The cathedral was founded in the 11th century by Bishop Reinald, an Englishman; the later Gothic edifice, considered one of the finest in Norway and built in place of the earlier church, burnt down in 1272, was restored in 1866. Textiles of wool, flax, and cotton, soap, preserves, margarine, and earthenware are the main products; there are iron foundries and shipyards. Fishing and fish-curing are the chief occupations. Founded in the 8th century, the town has been frequently burnt down and rebuilt. Stavanger was occupied by German troops on April 9, 1940, the first day of their invasion of Norway. The airport provided a base from which to assail British shipping off the Norwegian coast, and was frequently attacked by the R.A.F. The city was liberated when the German forces in Norway capitulated, May 8, 1945. Pop. 49,218.

Stave or **STAFF**. In music, the lines upon which, with the intervening spaces, notes are placed in order to indicate pitch. The most convenient number is found to be five, and a clef (*q.v.*) is placed upon it to fix their alphabetical names and their pitch. All staves are really selections from the great staff of eleven lines, which covers the range of the human voice from bass to soprano.

In staves the position of the clefs is immutable; it is only the accompanying lines which change. The staves used for piano music are practically the great staff, with the middle line removed for greater clearness in reading. In medieval times staves with six or

seven lines were often used, and in plainsong four lines are the practice.

The germ of the staff dates from the use of a single line in red about A.D. 900, to show tenor F in the neume notation. Later, a second line in yellow was added for C a fifth higher. To Guido d'Arezzo belongs the credit of having developed this germ into a staff in which both lines and spaces were utilised. Hucbald, it is true, used parallel lines, but he made use only of the intervening spaces. See *Staff*.

Staveley. Village of Derbyshire, England. It is 4 m. by rly. N.W. of Chesterfield. Standing on a coalfield, its chief industries are coal mining and iron working, especially the manufacture of cast-iron pipes. Hollingwood, a model village adjoining Staveley, was built to house employees of the great Staveley Coal and Iron co., which in 1948 published *Staveley Story*. The church of S. John the Baptist, an early English building restored, contains monuments to the Frecheville family. Pop. est. 16,000.

Stavisky Riots. French financial and political disturbances in 1934. These followed a fraud perpetrated by Serge Stavisky (1866-1934), a naturalised Frenchman from Russia, who had been fraudulently floating bonds through the state-controlled *Crédit Municipal* of Bayonne. President Lebrun ordered a search for Stavisky, for whom a warrant had been issued on a charge of disposing of worthless bonds valued at about £8,000,000 to state pawnbroking establishments, insurance companies, and banks. This was only part of a vaster scheme to raise money for a huge land speculation in Central Europe. Stavisky shot himself at Chamonix and died Jan. 9, 1934. The scandal had serious repercussions, leading to the fall of two governments and to violent outbreaks of rioting in Paris, Feb. 6-12, when Royalists and Communists fought each other in the streets, thousands of people being injured, and a general strike was declared.

Stavropol. Former name of Voroshilovsk (*q.v.*), a town of the R.S.F.S.R.

Stawell. Township and rly. junction of Victoria, Australia. It stands on the main Melbourne to Adelaide line, 150 m. S.E. of the latter city. The district is agricultural and contains a few gold mines and a number of freestone quarries. Pop. 4,840.

Stays. Nautical term for the supports which form part of the standing rigging of a ship. They take their name from the spars they support, as, for example, the topmast-stay, which holds the topmast in position. "Staying forward" a mast is making it lean forward. A vessel is in stays when she is going from one tack to another. Missing stays is when a vessel fails to respond to the helm and go about. *See Ship.*

Stead, WILLIAM THOMAS (1849-1912). British journalist. Son of a Congregational minister, he was



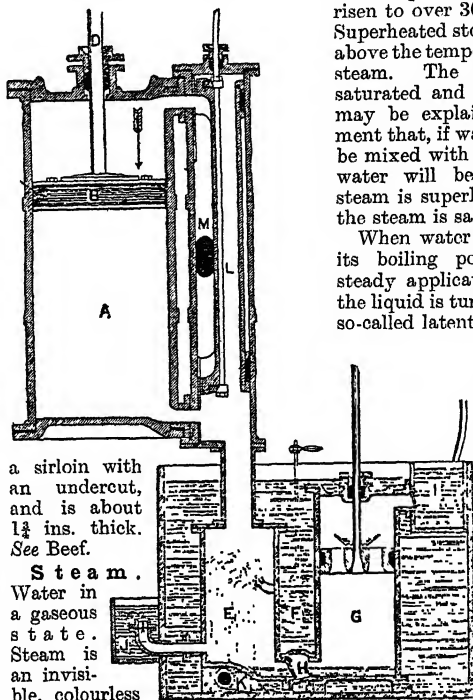
William T. Stead

born at Embleton, Durham, July 5, 1849, and educated at Silcoates school, Wakefield. Leaving a merchant's office to edit *The Northern Echo*, Darlington, 1871-80, he was assistant editor of *The Pall Mall Gazette*, 1880-83, and editor, 1883-89. He founded *The Review of Reviews*, 1890, started a penny Masterpiece Library, a series of Penny Poets, and the highly popular penny Books for the Bairns, and wrote political and other works. He was drowned when the *Titanic* foundered in the Atlantic, April 15, 1912.

Stead was one of the prominent publicists of his time, a founder of the "new journalism"; he popularised the interview, travelled on the Continent and in the U.S.A. as peace propagandist, advocated a strong British navy, was much concerned in social work, especially in criminal law amendment, and was influenced by spiritualism. His most startling contribution to journalism was his series of articles in *The Pall Mall Gazette*, 1885, under the title *The Maiden Tribute of Modern Babylon*. This exposure of the white slave traffic was based on personal research (for which, being technically guilty of abduction, he suffered three months' imprisonment) and had as direct result the passage of the Criminal Law Amendment Act, 1885. A memorial, on the Thames Embankment, erected by British and American journalists, was unveiled July 5, 1920. *Consult My Father*, E. W. Stead, 1913; *Life*, F. Whyte, 1925.

Steak. Thick slice of meat or fish. Beefsteak, which is boneless, is cut from the best parts of the

animal, and includes rump steak, buttock steak, and fillet steak (from the undercut of a sirloin). A Porterhouse steak is taken from



Steam Engine. Early type of double-acting condensing engine. A, steam cylinder. B, steam piston. D, piston rod. E, condenser. F, injection cock. G, air pump. H, foot valve between condenser and air pump. I, hot well. J, blow valve. K, cold water pipe. L, connecting eduction pipe. M, steam pipe.

a sirloin with an undercut, and is about $1\frac{1}{4}$ ins. thick. *See Beef.*

Steam.

Water in a gaseous state. Steam is an invisible, colourless gas with a specific gravity of .625 compared with that of air at the same pressure. The temperature at which water is converted into steam varies with the pressure. At a pressure of 14.7 lb. per sq. in., or 760 mm. of mercury, and at mean sea level, water is converted into steam at a temperature of 100°C . (212°F). The temperature of boiling water falls or increases as the pressure, the relation between the two having been worked out by Regnault. The white cloud which is seen issuing from a vessel containing boiling water is steam which has condensed into small particles of water on contact with air.

One pound of steam at normal atmospheric pressure occupies a minimum volume of 26.36 cu. ft., or steam occupies 1,660 times the volume it does as water. Steam at

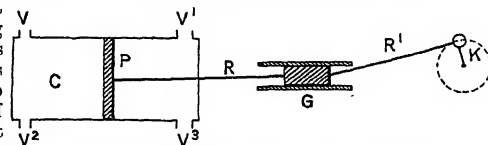
the temperature at which it is formed from water is called saturated steam. The pressure of saturated steam at 100°C . is 14.7 lb. to the sq. in., but at 215°C . it has risen to over 300 lb. to the sq. in. Superheated steam is steam heated above the temperature of saturated steam. The difference between saturated and superheated steam may be explained by the statement that, if water at boiling point be mixed with steam, some of the water will be vaporised if the steam is superheated, and none if the steam is saturated.

When water has been raised to its boiling point it requires a steady application of heat before the liquid is turned into steam, the so-called latent heat of steam.

For the use of engineers special steam tables are published, which give the absolute pressure in pounds per sq. in., the temperature of the steam corresponding to that pressure, the temperature of the water at the pressure, and various other figures. From these tables, by looking at the pressure gauge, say of a boiler, the temperature can be at once obtained.

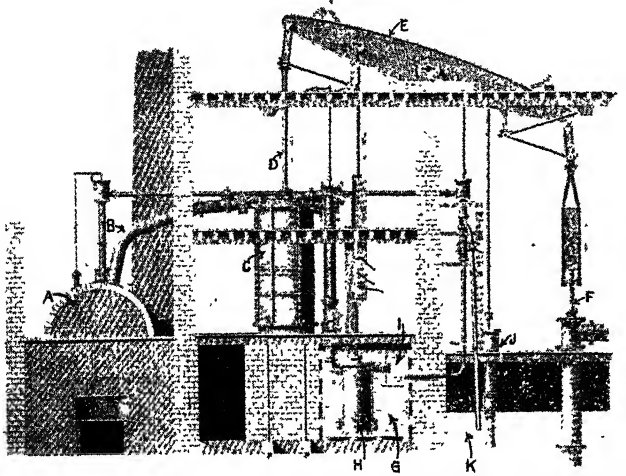
In addition to its commonest use in engines, steam is used for heating purposes, for disinfection, cleansing operations, as a fire extinguisher, and other uses. *Consult Steam Power*, W. E. Dolby, 1920; *Steam, Air, and Gas Power*, W. H. Severns and H. P. Degler, 1940.

Steam Engine. Machine for the conversion of heat energy into useful work by means of the expansive force of steam. Many early attempts were made to use steam



Steam Engine. Diagram of the piston and cylinder for transmitting motion. *See text p. 7770*

as a motive power, the earliest recorded being the aeolipile of Hero of Alexandria, c. 130 B.C. His apparatus resembled the modern



Steam Engine. Early type of single-acting engine of Boulton and Watt. A, boiler. B, steam pipe. C, cylinder. D, piston rod. E, beam. F, pump rod. G, condensing cistern. H, air pump. I, hot well. J, cold water pump. K, waste water well

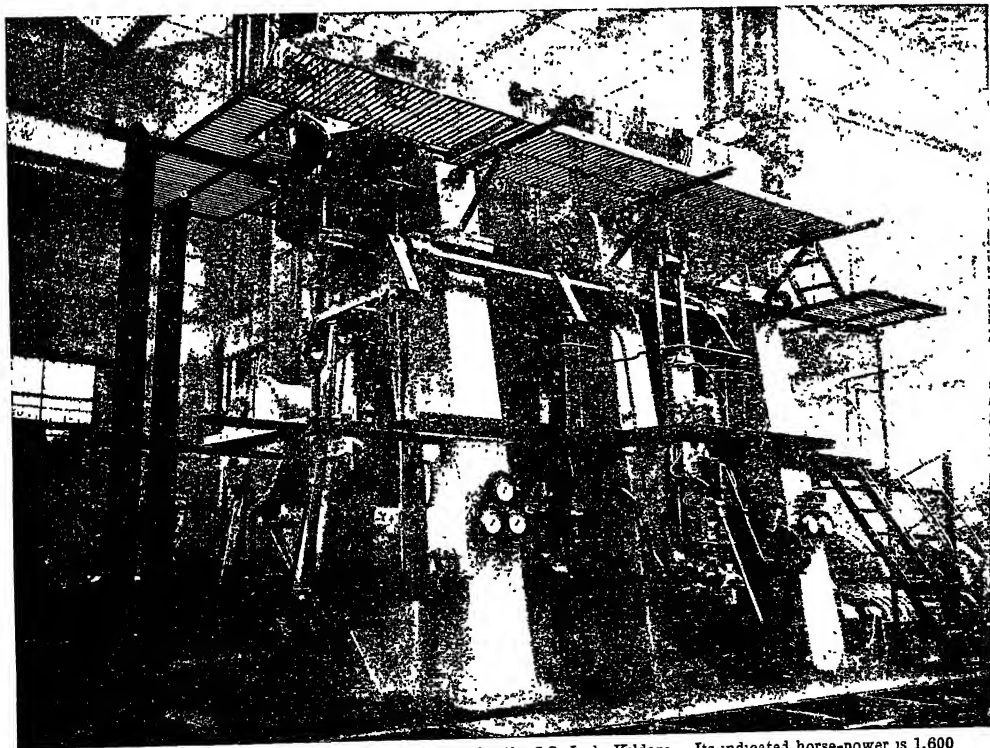
Barker's mill (*q.v.*), steam replacing the jets of water in the latter. Giovanni della Porta at the beginning of the 17th century adapted another of Hero's inventions, his well-known fountain, replacing the

expanding air used in the latter with steam, and in 1655 the marquess of Worcester is credited with the invention of a steam engine for the pumping of water. An important application of steam

as a motive power was made by Thomas Savery, who patented an engine in 1698. Essentially it consisted of a cylinder into which steam entered and forced out a charge of water, sucked into it by a previous charge of steam that was suddenly condensed by a jet of cold water allowed to flow over the outer surface of the cylinder. Savery's engines were erected in many parts of England for pumping water, and the modern pulsometer pump is constructed on the same general principle. To Savery is due also the first use of the term horse-power.

Savery's engine was considerably improved by Thomas Newcomen and John Cawley, who introduced a piston, driven down by atmospheric pressure as a vacuum was created in the cylinder by the condensation of the steam. Newcomen adopted the idea of the piston from a French engineer, Denis Papin. Newcomen's engine, like Savery's, was used for pumping water. The steam in the cylinder was condensed by a jet of water inside, instead of a flow of cold water outside, as in Savery's.

Both engines were extremely wasteful in consumption of steam.



Steam Engine. Triple-expansion marine engine, built for the S.S. Lady Kildare. Its indicated horse-power is 1,600
By courtesy of William Beardmore & Co., Ltd

The next important step forward came from James Watt, who patented a separate condenser in 1769. The double-acting engine followed. From the time of Watt's improvements the advance of the steam engine was rapid. Richard Trevithick applied it to the first locomotive to run on rails in 1804. Hornblower a few years previously brought out the first compound engine, and the improvements which followed were mainly those based on a wider choice of materials, and extended research on strength of materials, properties of steam, heat transmission, etc.

Steam engines may be classified as single-acting or double-acting, condensing or non-condensing, or of the high-speed or low-speed types. When the expansion of the steam is carried out in two or more consecutive cylinders we have as a further classification the single, compound, triple, or quadruple expansion engines.

Essentially a steam engine consists of a piston and cylinder with the necessary gear for converting reciprocating motion of the piston into rotary motion of a shaft. Admission to and exhaust from the cylinder are regulated either by slide valve actuated by an eccentric or by poppet valves actuated by trip gears. Large engines are fitted with condensers, which reduce back pressure. The diag. (p. 7768) shows essential parts.

C is the closed cylinder containing valves V^1 , V^2 , V^3 for the admission and exhaust of steam to the cylinder. P is the piston, a steam-tight fit in the cylinder, and is connected by a piston rod R to a crosshead G, sliding between guides. The crosshead is connected by the connecting rod R^1 to the crank K. A flywheel is usually fitted to control speed fluctuations during a revolution.

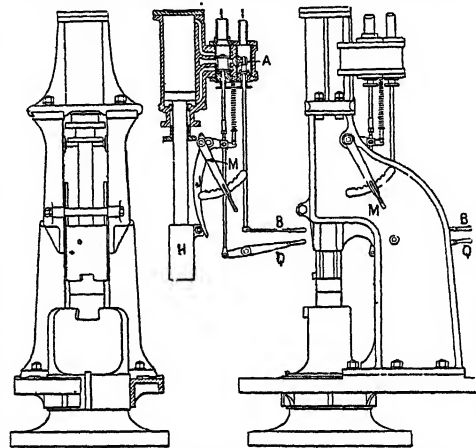
Horizontal engines are those in which the axes of the cylinder and piston are horizontal, and offer the general advantages that the working parts are of easy access and the weight of the engine can be distributed over a larger area. In the vertical engine the axes of the cylinder and piston are vertical.

When the motion is transmitted directly to the crank from the piston by a connecting rod, the engine is called direct acting. In the oscillating engine (now obsolete) the piston rod itself connects with the crank direct, and the cylinder oscillates with the motion, being mounted on trunnions for the purpose. The terms high-speed and low-speed usually refer to

speeds of revolution, but piston speeds (ft. per min.), on which the h.p. depends, may be the same. See Condenser; Crosshead; Flywheel; Governor; Locomotive; Railways; Valve; Watt, J. Consult Heat Engines, D. A. Low, 1920; Ripper's Heat Engines, 1948.

Steam Gauge. Particular form of manometer used for showing the pressure at any moment in a steam boiler or other steam container. The instrument may also be used to show the pressure of compressed air or gas or of water under pressure. See Pressure Gauge.

Steam Hammer. Power-driven hammer. The invention of James Nasmyth about 1842, the



Steam Hammer. Diagram showing main working parts of a Massey power hammer. See text

tup, or massive striker, of the steam hammer was attached to the lower end of the piston rod of an inverted cylinder. Steam was admitted below the piston to raise the hammer, and above it to accelerate the fall, by the movements of a lever controlling a steam-valve. Nasmyth's partner, Robert Wilson, introduced some valuable improvements which made the hammer self-acting. The figure gives details of a Massey steam hammer with overhanging frame, and a tup H moving in guides. The steam-valve is automatically moved up and down by means of the curved lever J—against which a roller on the tup strikes as the tup falls and rises—and steam is admitted alternately above and below the piston. The range of movement of the valve, and consequently of the tup, varies according to the position of lever M, which can be set in any one of several notches. For hand-working, the valve is moved directly by hand lever Q.

The stop-valve A, controlled by lever B, regulates the amount of steam admitted and therefore the force and speed of the blows. Some steam hammers are hand-controlled. The steam pressure used is 60–80 lb. per sq. inch.

The average force of the blow delivered depends on the weight of the tup, the speed at impact, and rigidity of support. Hammers for very heavy work have tups of over 100 tons, but very large hammers have been almost completely superseded by hydraulic presses. See Pile-driving.

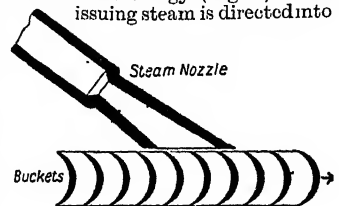
Steam Roller. This machine is described under Roller.

Steam Ship. Details of steamships are given under Ship.

Steam Turbine (Lat. *turbo*, whipping top, reel). Machine for converting the pressure energy of steam into kinetic energy and utilizing this kinetic energy to produce rotary motion of a wheel or drum which transmits power. There are two principal types: (1) reaction turbines, operating through the reaction of jets of steam issuing from nozzles, which move in opposite direction to the jets—the earliest

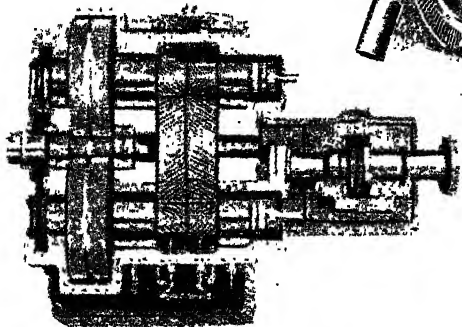
example is Hero's engine (130 B.C.); (2) impulse turbines, in which jets of steam from stationary nozzles impinge upon suitably shaped blades on a wheel, causing it to rotate—the earliest example is Branca's engine (1629).

A simple type of impulse turbine was introduced by De Laval, of Stockholm, in 1888. It consists of a set of suitably shaped nozzles in which the steam expands from boiler pressure to condenser pressure, thus converting heat energy into kinetic energy (Fig. 1). The issuing steam is directed into



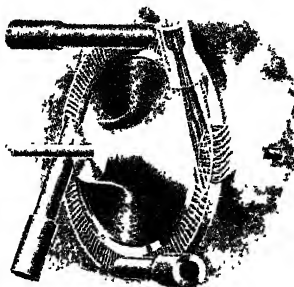
Steam Turbine. Fig. 1. Diagram showing arrangement of nozzle and buckets of a De Laval impulse turbine

curved blades on the rim of a rotating disk, the impulsive force on the blades driving the wheel, which delivers power through a reduction gear to a dynamo or other machine (e.g. a centrifugal separator). For economical working the speed of the wheel rim should be about half the speed of the issuing steam. With a boiler pressure of 135 lb.



Steam Turbine. View of gears and casing of a 1,200-h.p. engine. Top, right, De Laval steam turbine wheel with nozzles, illustrated diagrammatically in Fig. 1

By courtesy of The Power Plant Co., Ltd.



creasing the diameter of the drum on which they are mounted. Theoretically each element should be a little larger than the one before, and in the larger turbines the casing is tapered to permit of this, but for constructive reasons the increase is frequently carried out in

per sq. in. abs. and condenser pressure 2 lb. per sq. in. abs. (26-in. vacuum) the velocity of issue is about 4,500 ft. per sec. and the wheel rim speed should be about 2,000 ft. per sec. This would involve excessive centrifugal stresses both in disk and blading, and the speed in practice seldom exceeds 1,000–1,200 ft. per sec. The consequent reduction in economy limits the practical sizes of units to comparatively small values. Owing to the high revolution speed (30,000 a min. in some cases) a flexible shaft supports the disk and compensates for any slight degree of unbalance.

The first practical steam turbine, running at a moderate speed and utilising the full expansion in a large number of stages with small pressure drops in each stage, was the Parsons compound reaction turbine, introduced in 1884. Each "stage" consists of a row of fixed guide blades and one of moving blades, the latter being attached to a rotating drum and projecting outwards from it till they nearly touch the casing, while the former project inwards from the casing till they nearly touch the drum. In order to accommodate the increasing volume of the constantly expanding steam, these elements are made gradually larger from the high-pressure end of the turbine to the low-pressure or condenser end, by lengthening the blades or in-

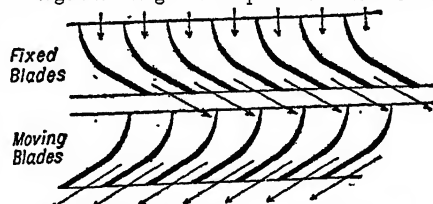
steps, each of which contains several rows of blades of the same size (Figs. 2 and 3). At each stage the steam undergoes a small drop of pressure with gain of velocity, leaving the moving blades with a push-off or reaction effect. A large number of stages is necessary to ensure that the steam is fully expanded.

Fig. 3 shows the essential features of the earlier type. Steam enters at A and expands through alternate rows of standing and running blades, finally exhausting at the low-pressure end. Since the blades are non-symmetrical (Fig. 2) there will be an end thrust on the rotating drum; this is compensated by balance pistons B, C, and D as

shown, any unbalanced thrust being taken by a thrust block which also serves for axial clearances of blading. Since there is a drop of pressure in the running blades on the drum as well as in the standing blades on the casing, leakage of steam past the tips of the running blades is possible and this is more pronounced in the smaller sizes of turbine. In later types adjustable axial clearance, or "end-tightening," is used at the high-pressure end, where the diam. is small and the pressure drop per stage is comparatively large.

Introduction of Generators

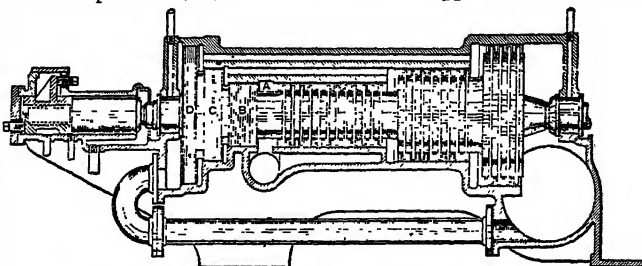
When Sir Charles Parsons first turned his attention to the steam turbine it was with the object of applying it to the driving of electric generating machinery, and so suitable did it prove for this purpose that turbo-generators came to be universally used in steam power stations, where units of up to 150,000 h.p., using superheated steam at pressures of from 600 to 1,200 lb. per sq. in., with stage feed heating by "bleeding" at a number of points of the expansion, are in operation. Research and experiment on blading shapes and materials, increasing the number of stages of expansion and use of



Steam Turbine. Fig. 2. Diagram illustrating principle of reaction turbine blading

"double-flow" exhaust, have reduced specific steam consumption to a figure much below that of the best reciprocating engines.

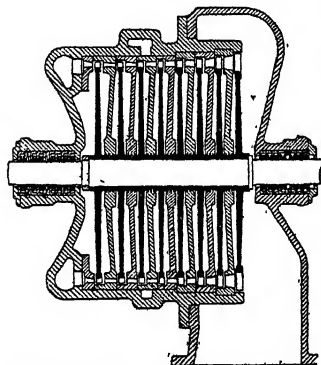
The use of turbines for the propulsion of ships dates from 1897, when the Turbinia, a little vessel with the then almost incredible speed of over 32 knots, made her appearance at the naval



Steam Turbine. Fig. 3. Diagram showing essential features of the earlier type of reaction turbine blading. See text

review held in that year. Since that date turbines have been fitted in fast cross-Channel steamers and in the fastest Atlantic liners. The first warship to be driven by steam turbines was the *Dreadnought* (*q.v.*); large warships came generally to be driven by turbines. For best efficiency the turbine should revolve quickly and the propeller slowly; to reconcile these requirements first single reduction and later double reduction gearing was interposed between turbine and propeller shaft. This makes it possible to split up the turbine into two or three elements driving the same gear wheel, thus saving space and allowing different speeds to be arranged for the different elements. In marine practice a high-speed turbine often drives a dynamo which supplies current to motors on the propeller shafts. Speed control and reversing can be effected from the bridge.

In order to obviate end thrust and reduce leakage losses, Rateau introduced a pressure-compounded impulse turbine (Fig. 4). Turbines constructed on this principle consist of a number of separate com-



Steam Turbine. Fig. 4. Diagram illustrating the Rateau pressure-compounded impulse turbine

partments, in each of which is a bladed wheel. The steam flows through all the compartments in series, passing from one to the next through nozzles in which a velocity corresponding to the pressure drop is generated. By adopting a sufficient number of stages, the velocity of the steam entering each can be reduced to any desired value, and thus can be made appropriate to the desired blade speed of the wheel on which it acts. The number of stages adopted will depend upon the total pressure drop, the successive pressure drops being so adjusted that an equal steam velocity is generated and utilised in each. In order to reduce the num-

ber of stages, and consequently to cheapen the machine, Curtis adopted the principle of "velocity compounding." In the early Curtis turbine the wheel of each stage, instead of carrying only a single row of buckets, was fitted with two, three, or even four rows. Between these, fixed guide blades projected from the casing, the function of these blades being to turn back the steam issuing from one row of running buckets and direct it upon the next. By this method it was hoped to use efficiently in each stage a much higher steam velocity than could be dealt with by a single row of blades. Many large machines were constructed on these lines, having only from three to six pressure stages, but the type was less efficient than a number of single-stage wheels. Single Curtis wheels are, however, sometimes used for the first stage of turbines in order to save space and first cost; also to increase the rigidity of the shaft.

In the earlier years the Parsons turbine was definitely more economical in heat consumption than the Rateau, but later developments produced machines between which there was little to choose on the ground of economy. Many turbines with impulse stages at the high-pressure end and reaction stages at the low-pressure end are in use. The Ljungstrom turbine is a reaction machine with radial flow and has no fixed rows of blades; in it the blades which correspond to the fixed blades of other turbines themselves rotate in the opposite direction to that of the other blades, each set of blades projecting from the face of a disk, and the rows interleaving with those of an opposing disk. In this turbine both shafts rotate in opposite directions and each carries its own electric generator. Most difficulties in construction have been overcome and some large units are in successful operation.

Since full expansion of the steam down to the back pressure is impracticable in a reciprocating steam engine, the power can be augmented by arranging for the exhaust steam to drive a turbine. This is convenient particularly for ship propulsion, since reversing does not then require a separate turbine. The turbine can drive an additional propeller by gearing or can generate electricity which can either drive a motor or reheat the steam as it passes from one cylinder to the next.

A later development in some large high-efficiency power stations

was the addition of a "topping" turbine to the existing plant. For instance, boilers working at 250 lb. per sq. in. were replaced by boilers designed for 1,250 lb. per sq. in. New turbines took steam at 1,250 lb. and exhausted at 250 lb. This exhaust steam, after reheating, was supplied to the existing turbines, the result being an increase of output of more than 20 p.c. with 25 p.c. reduction in fuel consumption per kWh. See *Gas Turbine*; *Turbine*.

A. T. J. Kersey
Bibliography. Steam Turbine, W. J. Goudie, 1917; Turbines Applied to Marine Propulsion, S. J. Reed, 1917; The Marine Turbine, J. W. M. Sothorn, 1919; The Steam Turbo-Alternator, L. C. Grant, 1922; Steam Turbine Operation, W. J. Kearton, 1937; Proceedings of I.Mech.E., I.E.E., and I.Mar.E.

Stearic Acid (*Gr. stear, fat*). Fatty acid, $C_{17}H_{35}COOH$. First described about 1820 by Chevreul, it occurs widely diffused throughout the animal kingdom, combined with glycerine, and constitutes the bulk of hard fats, such as suet and tallow. It is also found in many vegetable fats, such as palm oil and shea butter. Stearic acid is made on a commercial scale by decomposing low-grade tallow with sulphuric acid or superheated steam under pressure; the fats are split up in the process, the glycerine mixing with the water and the stearic acid floating on the surface. From this product pure stearic acid can be made by crystallisation from alcohol. Stearic acid, a white, lustrous, crystalline substance, forms stearates with the alkalis and alkaline earths. The stearates are the chief constituent of all ordinary soaps. Stearic acid is used for making candles and polishes, in rubber compounds, as a substitute for wax in ointments, and when partly neutralised as the basis of vanishing creams.

Stearin. The glyceride of stearic acid which occurs in a greater or less degree of purity in many natural fats. Stearin can be decomposed into glycerine and stearic acid by heat, and can be synthesised by heating together glycerine and stearic acid. The term stearin is applied to commercial stearic acid, and also to fats from which the liquid portion has been removed by pressure. The last-mentioned stearins, employed in the manufacture of margarine, are distinguished as lard stearin, cotton stearin, or palm stearin according to the fat employed in their preparation.

Steatite. Variety of talc, also known as soapstone (*q.v.*).

Stedman, EDMUND CLARENCE (1833-1908). American poet and critic. Born at Hartford, Conn.,



Edmund Stedman,
American poet

Oct. 8, 1833, he was educated at Yale. By 1859 he was on the staff of The New York Tribune, and during 1861-63 he was correspondent in the Civil War for The New York

World. His Poems, Lyrical and Idyllic, appeared in 1860, his collected poems in 1897, and he achieved a great reputation by his volumes of criticism, which include Victorian Poets, 1875; Poets of America, 1885; Nature and Elements of Poetry, 1892. He died Jan. 18, 1908.

Steed, HENRY WICKHAM (b. 1871). British journalist. Born Oct. 10, 1871, son of a Suffolk solicitor, he was educated at Sudbury grammar school and



H. Wickham Steed,
British journalist
Russell

he was in 1918 associated with Northcliffe in directing propaganda in enemy countries. Wickham Steed was editor of The Times, 1919-22; then for eight years he owned and edited The Review of Reviews. A lecturer on European history at King's College, London, 1925-38, he frequently broadcast on world affairs for the B.B.C. overseas service. An authority on Germany and Central Europe, he published many books on Hitler; also The Hapsburg Monarchy, 4th ed. 1918; Through Thirty Years, 1924; A Way to Social Peace, 1934; The Doom of the Hapsburgs, 1937; Words on the Air (broadcast talks), 1946.

Jena, Berlin, and Paris universities, and became The Times correspondent in Rome, 1897-1902, and Vienna, 1902-13. As that newspaper's foreign editor,

for the steelmaking furnace. There are three chief steelmaking processes in use, the Bessemer, the open hearth, and the electric arc; each of these has modifications, but all utilise the same fundamental principle of refinement, *viz.* oxidation of the impurities. In the Bessemer process, the previously melted charge is oxidised by the blowing of air. In the open hearth and the electric arc processes, oxidation is effected by the oxidising nature of the furnace atmosphere, and by the addition of iron ore. Following the oxidation of the impurities, excess oxygen is removed from the metal in all processes by the addition of de-oxidising agents, and the liquid steel is then cast into moulds to solidify. These moulds may be either of simple shape to provide ingots for forging or rolling, or designed to give castings of the desired form without the need for mechanical shaping, except possibly by machining.

Method of Casting

Although steel and other metals may be cast to shape, the optimum properties of the metals are not developed by this method of shaping. By casting into simple ingot form, and then using mechanical treatment to bring the metal to the desired size and shape, the properties of the metal are improved. This improvement is due mainly to the greater uniformity of the metal structure after mechanical treatment, or "working."

The solidified ingots are removed from the moulds, reheated slowly to a temp. which depends on the composition of the steel (usually about 1,100° C.), and then forged or rolled. This operation is classed as hot working, because the working of the steel is done at a sufficiently high temp. to prevent the steel from hardening during the deformation. Rolling is the cheapest way of hot working, but it is not so effective in breaking down the irregularities of the cast structure as is forging. Hammer forging quickly breaks down the cast structure on small ingots, and is extensively used for working tool steels, but press forging is more efficient for large ingots.

The final sizing and shaping may be done by hot working or by cold working, *e.g.* by cold rolling, drawing, or pressing. Cold working involves mechanical treatment at atmospheric temp. so that the deformation hardens the steel; intermediate annealing may then be necessary to soften the steel

STEEL: MANUFACTURE & PROPERTIES

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This Encyclopedia contains articles on the various elements in steel, e.g. Carbon; Chromium; Iron; Molybdenum; Tungsten, etc. See also Bessemer Process; Casting; Iron and Steel Construction; Lattice; Metallurgy; Open Hearth Furnace; Pig Iron; Siemens Process; Tempering; Wrought Iron

Steel is an alloy of iron and carbon, containing up to 1.7 p.c. of carbon. When solid, it contains the carbon either as cementite (a compound of iron and carbon, Fe₃C), or in solid solution in the iron. Iron-carbon alloys of carbon content between 1.7 and 4.5 p.c. are classed as cast irons.

Steelmaking by melting and solidification was probably first developed by the Chinese, and it was probably about 350 B.C. that the earliest method of steelmaking used in India was first discovered. Following the Dark Ages, steel was made in the western world by heating solid iron in contact with charcoal at a yellow heat (about 1,100° C.). The charcoal carburised the iron, but only to a shallow depth. To overcome the sharp gradient in carbon content from the outside to the centre the bars were hammered down to give blister steel; this was broken into short lengths which were stacked on top of one another, heated to a welding heat, and re-forged to give shear steel. This contained as much carbon near the centre as it did near the out-

side, but it was still streaky owing to the unequal carburisation of the cemented bar.

About 1740, Benjamin Huntsman, a Doncaster clock-maker, rediscovered the art of steelmaking by melting and solidification, obtaining in this way a uniform carbon content throughout the steel. Steel made by the Huntsman method became known as crucible, or cast, steel.

The manufacture of steel begins with the smelting of iron ores to produce pig iron. Steels may be divided into two groups, tool steels and structural steels. To produce tool steel, carefully selected pig iron is converted into a very pure form of iron called puddled bar, and this is then alloyed with carbon and any other alloying elements in a simple melting process. The melting and alloying can be done in a crucible, as used by Huntsman, in an electric arc furnace, or in an electric induction furnace; the liquid steel is cast into moulds to give ingots for forging.

To produce structural steel, pig iron and steel scrap, in varying proportions, constitute the charge

Machining can be used for shaping either during or after the working operations.

The outstanding features of steel are its cheapness and its mechanical properties. No reliable record indicates when the phenomenon of hardening steel by quenching was first discovered. To this property of being hardened by quenching are due the excellent mechanical properties obtainable in steels.

Changes in Lattice Form

On being heated to about 900° C., iron changes its crystal lattice form from what is termed α -iron, which has a body centred cubic lattice, to γ -iron, whose lattice is face centred cubic; the reverse occurs on cooling through the critical temp. range. The low temp. form of iron, α -iron, dissolves only traces of carbon, the excess carbon usually forming a compound, cementite Fe_3C ; but γ -iron, the high temp. form, can dissolve appreciable amounts of this element. Therefore, when a steel is heated to above the critical range of temp., not only does the iron change from the α to the γ form, but the carbon which exists as cementite at low temps. dissolves in the new γ -iron crystals. If the steel now be allowed to cool slowly, the iron reverts to the α form, and the carbon is rejected or precipitated as stringers of cementite. This occurs when steel is fully annealed or normalised, i.e. heated to above its critical range, and cooled in the furnace in which it was heated (full annealing) or in air (normalising). Normalised and annealed steels are relatively soft. If, however, the steel is quickly cooled, say by quenching into cold water, the separation of the cementite does not have time to occur, and the carbon atoms are maintained dissolved in the α -iron crystals. These α -iron crystals, "super-saturated" with carbon, are called martensite, and to them is due the hardness of quenched steels. The higher the carbon content of the steel, the harder can it be made by quenching.

After a steel has been hardened by quenching, it is usually brittle, and tempering is advisable in order to impart toughness. Tempering involves reheating the hardened steel to a suitable temp., somewhere below 700° C. This treatment allows the α -iron crystals to reject the excess carbon as cementite in a fine, globular form, and the resultant tempered martensite structure of very hard,

finely dispersed cementite in a tough α -iron matrix develops the best combination of strength and toughness in the steel.

"Austempering" and "mar-tempering" are heat treatment processes in which the duplex hardening and tempering treatments are replaced by a single treatment of quenching the steel into a liquid bath held at a suitable temp. and retaining it in the bath for a suitable time before cooling to atmospheric temp.

While the properties of carbon steels which make it possible to harden and temper them are particularly useful, the drastic quenching that is necessary to harden the steel is often a serious limitation owing to the likelihood of distortion and cracking. However, the addition of special alloying elements, e.g. nickel and chromium, reduces the rate of cooling necessary to harden the steel, and, whereas carbon steels require cold water quenching, steels containing suitable alloying elements can be hardened by quenching in oil or even by cooling in air; hence terms like oil hardening and air hardening steels. The use of these steels reduces the dangers of distortion and cracking, makes it possible to harden larger sections of steel throughout, and gives improved resistance to shock. Carbon steels with ultimate tensile strength values exceeding about 50 tons per sq. in. tend to be brittle, but some alloy steels may still be reasonably tough with ultimate tensile strength values exceeding 100 tons per sq. in.

High Speed and Other Steels

In addition to improving mechanical properties at atmospheric temps., alloying additions also impart certain characteristic properties to steel. High speed steels, and stainless and heat resisting steels are examples. Carbon steels which have been hardened by quenching tend to lose their hardness on being heated to temps. in excess of about 200° C., but the addition of elements like tungsten and chromium markedly retards the rate of softening. This discovery has been of great value in the machining of metals, for, whereas carbon steel tools soften and lose their cutting efficiency if the temp. of the cutting edge exceeds about 200° C., high speed alloy steel tools retain their hardness and cutting efficiency up to red heat, which makes it possible for machining operations to be greatly accelerated. Carbon steels possess poor corrosion-resisting

properties both at atmospheric and elevated temps. The addition of chromium in excess of about 12 p.c. by weight, however, transforms steels from inferior to superior corrosion- and heat-resisting alloys, producing what are called stainless steels. These alloy steels are invaluable to engineers for use in particular conditions; but they are more expensive than carbon steels.

Steel, ALLAN GIBSON (1858–1914). English cricketer. Born Sept. 24, 1858, he was educated at



Allan G. Steel,
English cricketer

Marlborough and Trinity Hall, Cambridge. He played cricket for his school and university, being captain of Cambridge in 1880, and then of Lancashire. On nine occasions he played for England against Australia. Batsman and bowler, Steel scored 135 and 148 not out against the Australians, and in 1879 he bowled unchanged throughout both innings for the Gentlemen against the Players. In 1883 Steel became a barrister; in 1901 a K.C.; and in 1904 recorder of Oldham. He died June 15, 1914.

Steel, FLORA ANNIE (1847–1929). British novelist. Born at Harrow, April 2, 1847, her surname being Webster, she lived in Bengal after marrying a civil servant in 1867, and obtained a knowledge of

the country which is reflected in many of her novels.

A prolific writer, she married some of her work by sentimentality. Her best-known novels



included *The Potter's Thumb*, 1894; *On the Face of the Waters* (a tale of the Indian Mutiny), 1896; *The Hosts of the Lord*, 1900; *The Law of the Threshold*, 1924; *The Curse of Eve*, 1928. Her autobiography, *The Garden of Fidelity*, appeared in 1929, the year in which she died (April 12).

Steele, SIR RICHARD (1672–1729). British writer. Born in Dublin of mixed Irish and English parentage, he was educated at the Charterhouse and at Christ Church and Magdalen College, Oxford. Steele and Addison were friends at school, and the friendship continued during their university

days. Steele left without a degree in 1694, and, enlisting in the army, rose to the rank of captain in Lord Lucas's Fusiliers. To the astonishment of his brother officers the somewhat dissipated young soldier published a pious manual entitled *The Christian Hero*, 1701. The same year saw the production of his first play, a comedy entitled *The Funeral*; or, *Grief à la Mode*,



Rich Steele

From an engraving by W. Holt

followed later by two others. The moral tone which characterised Steele's plays was a complete contrast to the licence of the Restoration dramatists. His fourth and best play, *The Conscious Lovers*, was produced towards the end of his life in 1722.

The turning point in Steele's life came when in 1707 he was appointed gazetteer to the government. His work in this connexion soon suggested to his mind the possibility of publishing something on a broader basis than the formal official Gazette. The result was *The Tatler* (q.v.), the first number of which appeared April 12, 1709. From the 18th number he had the cooperation of his friend Addison, and the literary partnership continued when for some obscure reason *The Tatler* was discontinued, and two months later, March 1, 1711, *The Spectator* (q.v.) was started. This stopped in Dec., 1712, and was followed by other periodicals, including *The Guardian* and *The Englishman*, but all were short-lived.

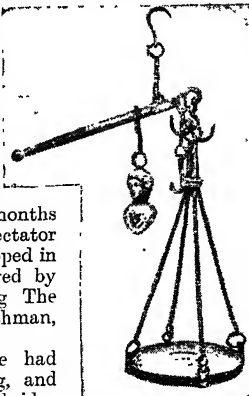
In the meantime Steele had entered politics as a Whig, and was elected M.P. for Stockbridge in 1713, but a violent pamphlet by him, *The Crisis*, resulted in his

expulsion from the house. In 1715 he re-entered parliament as member for Boroughbridge, and was knighted. Steele made himself so obnoxious to the government over the Peerage Bill that he was deprived of the supervisorship of Drury Lane, which had been given him as a political reward. He died at Carmarthen, Sept. 1, 1729.

An interesting light is thrown on Steele's life and amiable character by the letters, published after his death, which he had written to his second wife. As a writer Steele is usually not as effective as Addison, but his prose has a careless strength and originality which that of his friend lacks, while his humour is more genial. See Addison, J.; *English Literature*; Prose. Consult Lives, H. R. Montgomery, 1865; Austin Dobson, 1888; G. A. Aitken, 1889; W. Connelly, 1934.

Steel Engraving. Art or process of engraving on steel. It is also used for an impression taken from an engraved steel plate. See Engraving.

Steelyard. Balance or weighing machine having a lever with two arms of unequal length. In a special sense the Steelyard was the name given to a community of foreign merchants, mostly German, who settled in London in the 13th century under the protection of charters. Among their early privileges was the safe keeping and repair of Bishopsgate, in return for which they were allowed free passage for their goods by that gate, and other valuable trading rights. They were dispossessed in 1460 of their tenancy of the gate owing to failure to keep it in repair. Attempts were made to oust the Germans from their other privileges, but they held their own with



Steelyard of Roman make, dating from the 1st century A.D.

the help of the Hanseatic League until the Merchant Adventurers successfully challenged German supremacy in the Baltic and elsewhere. In 1579 the Steelyard lost all rights but those in Thames Street, and on Aug. 4, 1598, the German merchants were forced to leave their

stronghold. See *Balance*; *Hanseatic League*; *Merchant Adventurers*; *Staple*.

Steen, JAN (1626-79). Dutch painter. Born at Leyden, he studied at Utrecht, and later under



Jan Steen,
Dutch painter

Jan van Goyen at The Hague. He worked alternately at Leyden, The Hague, Delft, and Haarlem, where he was influenced by Adrian Ostade, and his genre pictures, of which many are preserved at Amsterdam and The Hague, are highly prized. He is an outstanding painter of the manners and costume of the Dutch peasants of his day, delighting in depicting scenes of gaiety. He died at Leyden in 1679.

Steen, MARGUERITE. Contemporary writer. She was educated privately, and having been a schoolmistress during the First Great War, went on the stage. Joining Fred Terry's company, she toured the provinces for three years. Her first novel, *Gilt Cage*, appeared in 1927, and she achieved best-sellers with *Matador*, 1934; and *The Sun Is My Undoing*, 1941. She wrote also biographies of Sir Hugh Walpole, 1933, and Sir W. Nicholson, 1943; and, with D. Patmore, the play *French for Love*.

Steenbeek. River of Belgium, in the prov. of W. Flanders. Rising slightly W. of St. Julien, it flows N.W. and joins the St. Jean near Bixschoote. Between the rivers Kortbeek and Steenbeek much heavy fighting took place in the First Great War.

Steenbok (Dutch, stone buck). Small species of S. African antelope, *Raphicerus campestris*. It is distinguished by its upright horns about 4 ins. long, the presence of a gland-cavity in the skull, and the absence of lateral hoofs. Less than 2 ft. high, and of a tawny colour, it conceals itself well on the veld. It is sometimes called steinbock, a German name properly applied to the Alpine ibex, *Capra ibex*, of Europe. Pron. stainbock.

Steenwyk. Town of the Netherlands, in the prov. of Overijssel. It lies on the Steenwyker Diep, 8 m. by rly. N.W. of Meppel. There is active trade in local agricultural produce, and small industries in wood, tobacco, and tanning. In the neighbourhood are large pauper colonies engaging in agriculture,

Frederiksoord, Wilhelminasoord, and Willemsoord, each of about 450 houses, founded in 1816-17 by a charity organization. Pop. 8,900.

Steeple (A.S. *stypel*, a lofty tower). Comprehensive name for the tower, belfry, and spire of a church. See Belfry; Tower.

Steeplechasing. Horse-racing over obstacles. Its origin was indisputably a race on horseback from one church steeple to another which would be a landmark. "Hunting matches" were held in Queen Elizabeth's day—there is a reference, a few years later, to one at Huntingdon between Lords Haddington and Sheffield. The first steeplechase of which there is an authentic account took place in Ireland in 1752; this was a match between one O'Callaghan and Edmund Blake, the course, $4\frac{1}{2}$ m., lying between Buttevant church and S. Leger church. Alken's painting *The First Steeplechase on Record* is alleged to represent a race c. 1803 among cavalry officers stationed at Ipswich, but may have been an imaginative effort on the part of the artist.

Over country fenced and enclosed, steeplechasing has a recorded history from 1792, when three competitors rode an 8-mile course in Leicestershire. At Bedford in 1810 there was a 3-mile event over a made course with 8 built-up fences. An organized steeplechase meeting at St. Albans in 1830 was the precursor of similar meetings all over the country, and by 1866 there was racing under rules at 89 courses. The first Grand National (*q.v.*) was decided at Aintree on March 1, 1839, and was won by Lottery; the 18 runners included Conrad, ridden by Capt. Becher, whose name is commemorated in the Aintree water-jump, Becher's Brook.

Messrs. C. J. and E. Weatherby issued their first volume of *The Racing Calendar* in 1867; from the set of Grand National steeplechase rules therein have grown the existing rules issued by the National Hunt committee. Founded in 1863, this body corresponds in function to the Jockey Club (*q.v.*). The N.H.C. organizes annually its own meeting, first held at Market Harborough in 1860, and for many years now at Cheltenham; its principal event is the National Hunt Steeplechase, 4 miles, for horses that have never won, ridden by amateurs. The N.H.C. also sponsors point-to-point racing. Racing under N.H. rules is conducted at upwards of 50 courses,

including Aintree (Liverpool), Cheltenham, the "park" courses at Sandown, Kempton, and Hurst, Bogside, where the Scottish Grand National is held, Haydock Park, Manchester, and all over the Midlands. Hurdle races, an integral part of cross-country sport, are run over distances from $1\frac{1}{2}$ m. upwards. Flights of hurdles are distributed across racecourses in the proportion of 4 flights to every mile. These obstacles, smaller than fences, are taken at a much faster pace.

The steeplechasing season opens in Aug. and ends in May, but its most important period is from Oct. to April. The point-to-point season, organized by the various hunts, runs from Feb. to early May. All courses except Cheltenham are usually laid out side by side with flat race courses. A large proportion of the horses are owned by individuals who race on a modest scale and often train their own horses. Beginning as late 3-year-olds, the horses, mostly geldings, often continue their careers until late in life; winners at the age of 15 are not uncommon. A fair proportion of the fields consist of thoroughbreds, but the ideal jumper is bred from thoroughbred and hunter stock.

Steer. Word synonymous with bullock. It is applied to male beef cattle of any age.

Steer, PHILIP WILSON (1860-1942). British painter. He was born at Birkenhead, Dec. 28,



P. Wilson Steer,
British painter

1860; educated at Hereford cathedral school and Gloucester art school; and in Paris studied under Bouguereau and Cabanel. He exhibited at the R.A. in 1883, but soon became one of the first exhibitors at the New English art club (*q.v.*). Influenced during youth by Monet, he later adopted the impressionistic technique of Constable. Among the supreme artists of his time, primarily a landscape painter, he showed comparative indifference to the forms of objects, and was preoccupied with light and colour. His water-colours were specially praised. Steer's best-known works include Chepstow Castle, Painswick Beacon, and several fine paintings of the Severn Vale. Twelve canvases are at the Tate

Gallery, and a self-portrait (1906) is at the Uffizi Gallery, Florence. Assistant professor at the Slade school, Wilson Steer was awarded the O.M. in 1931. He died at Chelsea, March 21, 1942. Consult *Paintings of W. Steer*, R. Ironside and J. Rothenstein, 1944; *Life and Works*, D. S. MacColl, 1945.

Steerforth, JAMES. Character in Dickens's novel *David Copperfield*. David's old schoolfellow, a young man of ability, wealth, and good looks, he persuades Little Em'ly, Daniel Peggotty's niece, to elope with him and then abandons her. In the end he is drowned in a shipwreck off Yarmouth.

Steevens, GEORGE WARRINGTON (1869-1900). British journalist. Born at Sydenham, Kent, Dec.



G. W. Steevens,
British journalist

10, 1869, he was educated at the City of London school and Balliol College, Oxford, and became a fellow of Pembroke College. As editor of *The Cambridge Observer* and contributor to *The National Observer*, *Pall Mall Gazette*, and *Blackwood's Magazine*, he displayed brilliant literary power and originality. Joining the *Daily Mail* in 1896, he described the presidential election campaign in the U.S.A. in articles published as *The Land of the Dollar*, 1897. Other contributions appeared in book form as *With the Conquering Turk*, 1897; *With Kitchener to Khartum*, 1898; *The Tragedy of Dreyfus*, 1899. Sent to South Africa on the eve of the war, he was in Ladysmith when it was besieged, and died there of enteric fever, Jan. 15, 1900. His S. African articles were published as *From Cape Town to Ladysmith*. He also wrote *Monologues of the Dead*, 1896.

Stefanie. Lake of Africa. It lies mainly in Abyssinia, but partly in Kenya Colony, N.E. of Lake Rudolf. Its alt. is 1,830 ft.

Stefan's Law. The principle, discovered empirically by J. Stefan in 1879, and deduced from thermodynamic considerations by Boltzmann in 1884, that the rate of emission, E , of radiant energy from unit area of a black body is proportional to the fourth power of the absolute temperature T ; i.e.

$$E = \sigma T^4$$

where σ is Stefan's constant, equal to 5.7×10^{-5} erg cm.⁻² sec.⁻¹ deg.⁻⁴. See Radiation.

Stefansson, VILHJALMUR (b. 1879). Canadian Arctic explorer. Born Nov. 3, 1879, at Arnes, Manitoba, of Icelandic parentage, he graduated at Iowa university in 1903. In 1908 he was commissioned by the American museum of natural history to make an ethnological survey of the Central Arctic coast of America. Among his many discoveries on this expedition was that of the blond Eskimos of Victoria Land. In 1913 he was sent north by the Canadian government and, notwithstanding the loss of his vessel, the *Karluk*, pursued his exploration on sledge, and discovered Prince Patrick Land. He remained in the Arctic regions until 1918, having mapped large areas of coast. He published *My Life with the Eskimo*, 1912; *Stefansson-Andersen Expedition*, 1909-12, 1914; *The Friendly Arctic*, 1922. See Arctic Exploration.



Vilhjalmur Stefansson, Arctic explorer

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Stegemann, HERMANN (b. 1870). Swiss historian. He was born at Coblenz May 30, 1870, and worked as a journalist in Zürich, Basel, and Berne. During the First Great War, he attracted international attention by objective comments on the war, published in the *Berne Bund*. After writing a history of the war, 4 vols., 1918-21, he was appointed professor of history at Munich university. He retired before Hitler's advent to power, and went to Zürich, where he again printed valuable discussion of the strategy of the Second Great War. As a novelist he wrote several Alsatian stories, e.g. *Daniel Junt*, 1905; *Die Krafft von Illzach*, 1913; *Die Herren von Höhr*, 1932; and an autobiography, 1930.

Stegocephalia (Gr. *stegein*, to cover; *kephalē*, head). Fossil amphibia distinguished as having an armour of bony scales. Found in strata from the Lower Carboniferous to the Upper Trias, they were capable of living partly on the land, possessing lungs. They include some of the largest amphibia known, and were mostly lizard-like in shape, with two pairs of limbs, long tail, and flattened head. See Reptile.

Stegosaurus. One of the great fossil dinosaurs. Ranging up to 30 ft. in length, with short limbs and powerful tail, it was remark-

able for the possession of a ganglion, controlling the nervous system, that was larger than the brain of the animal. See Dinosaur.

Stein, CHARLOTTE VON (1742-1827). Friend of Goethe. She was born on Christmas day, 1742, married the duke of Saxe-Weimar's master of the horse, became the intimate friend of Goethe, and is known to fame as the recipient of a long series of his letters. The intimacy was broken for a time by his marriage, but had been renewed before Charlotte died Jan. 6, 1827. Goethe's letters to her were first published during 1848-51, and the relationship of the two has given rise to a considerable literature. Consult Charlotte v. Stein, H. Düntzer, 1874; Goethe und Frau von Stein, E. Adler, 1887; Lotte in Weimar (fiction), T. Mann, trs. 1940.

Stein, GERTRUDE (1874-1946). American writer. She was born at Alleghany, Pa., Feb. 3, 1874, and educated at Radcliffe College, Harvard. She studied brain anatomy at Johns Hopkins university, but abandoned it, and settled in Paris in 1904, where she was a prominent figure in the world of art and letters, a patron of Picasso. She turned to writing, contributing to such coterie magazines as *Transition*. From the first her work was experimental; she played with words, forming sentence patterns that bore little or no relation to the use of words as the instruments of ideas. She had numerous imitators, but founded no school. She wrote *Three Lives*, 1908; *Tender Buttons*, 1915; *Autobiography of Alice B. Toklas*, 1933; *Wars I Have Seen*, 1946. With Lord Berners she evolved the ballet *Wedding Bouquet*. On July 27, 1946, she died in Paris.



Gertrude Stein, American writer

Stein, HEINRICH FRIEDRICH KARL, BARON VON (1757-1831). German statesman. Born Oct. 26, 1757, of an old family of imperial knights at Nassau, he studied law at Göttingen, and entered the Prussian service. He rose rapidly and did great work as minister for

commerce during the troubled years, 1804-06. In 1807 he was dismissed for urging the establishment of a responsible cabinet, but he resumed office as minister of the interior.

His wise reforms after the disaster of Jena conferred a large measure of self-government on the German towns, and he would have proceeded to a similar measure for the rural districts, but Napoleon divined that Stein was working for the restoration of the Prussian people to a great nation, demanded his dismissal as an enemy of France, and ordered his seizure. Stein then escaped to Bohemia. Fearing that his surrender might be demanded by Napoleon, he went in 1812 to St. Petersburg at the request of Alexander I. After the battle of Leipzig, 1813, he presided over the commission for the control of occupied territory.

At the congress of Vienna he worked hard to secure a consolidation of Germany, making great use of his influence over the tsar. He then retired into private life, occupying himself partly with the great collection of documents on German origins, *Monumenta Germaniae Historica*. Stein must be regarded as one of the makers of modern Germany. He died at his residence, Kappenberg, Westphalia, June 29, 1831. Consult *Life and Times*, Sir J. Seeley, 3 vols., 1878; Baron Stein, *Enemy of Napoleon*, C. de Grunwald, 1936.

Stein, SIR MARK AUREL (1862-1943). A Hungarian-born British explorer and writer. Born of Jewish stock at Budapest, Nov. 26, 1862, he was educated at Dresden, Vienna, and Tübingen universities, and went in 1888 to India as principal of Lahore Oriental College. In 1899 he became a British subject, and began a series of archaeological explorations in Turkistan, W. China, and Tibet. He was on journeys through Russian Turkistan and Persia during 1913-16, bringing back valuable additions to the British Museum and Delhi Museum. Other expeditions were to Baluchistan, 1926-28, and S. Persia, 1932-33. Sir Mark was knighted in 1912. His books included *Sand-buried Ruins of Khotan*, 1903; *Ancient Khotan*, 1907; *Serindia*, 1921; *On Ancient Central Asian Tracks*, 1933; *On*



Baron von Stein, German statesman

Old Routes of Western Iran, 1940. He died at Kabul, Oct. 26, 1943, bequeathing Oriental MSS. to the Indian Institute at Oxford, and a legacy to form the Stein-Arnold fund for exploration of India, China, and Persia.

Steinach, EUGEN (1861-1944). Austrian physiologist and biologist. Born at Hohenems, Vorarlberg, Jan. 27, 1861, he studied medicine at Vienna, and became professor and director of the physiological institute at Prague, and later director at the biological institute, Vienna academy of science. He wrote important works on the sex transformation of animals, and discovered the specific male and female sex hormones, but is best known for his experiments in human rejuvenation. These proved successful but for a limited period. His book about this method was published in 1920. He retired in 1930, and died in Vienna.

Steinbeck, JOHN ERNST (b. 1902). American novelist and playwright. Born Feb. 2, 1902, at Salinas, Calif., he attended his high school and spent a year at Stanford university before going into journalism. To this profession he returned in the Second



John E. Steinbeck,
American novelist

Great War as war correspondent of the Daily Express. His name was made, however, as a story-teller whose powerful sense of drama was second only to an intense concern with the social and economic struggles of the poorer classes. Cup of Gold, 1929, was his first book; Tortilla Flat came in 1935; more famous are Of Mice and Men, 1937; The Grapes of Wrath, 1939, set in the "bad lands" of the northern states, and awarded the Pulitzer prize for 1940; The Moon is Down, 1942, a tale of German-occupied Norway. These three were all dramatised and filmed. Steinbeck wrote Cannery Row, 1945; The Wayward Bus, 1947.

Steinitz, WILHELM (1837-1900). Bohemian chess-player. Born in Prague, May 18, 1837, he was educated at the institute of technology, Vienna. In 1866 he beat Anderssen in a chess match by 8 games to 6; in 1868 carried off the first prize in the British Chess Association handicap; and first prize in the London grand

tourney in 1872. At the chess congress in Vienna in 1873 he won first prize; and in 1876 defeated Blackburne in 7 consecutive games. Steinitz was for some time chess editor of The Field. In 1884 he settled in the U.S.A., where he published the International Chess Magazine from 1885 to 1891. One of the most scientific players who ever lived, he had a mental collapse and died insane at New York, Aug. 12, 1900.

Steinkirk or **STEENKERQUE**. Village of Belgium. It is 5 m. N.E. of Soignies. Here, Aug. 3, 1692, was fought a battle between the English and French. Louis XIV hoped to restore the French prestige by a decisive battle. William III made a surprise attack on the French army at Steinkirk, but an English victory was prevented by French reinforcements.

Steinmetz, CHARLES PROTEUS (1865-1923). German-American engineer. Born April 9, 1865, at Breslau, he emigrated at 24 to the U.S.A., where he eventually became consulting engineer to the General Electric co. at Schenectady. He died Oct. 26, 1923. Steinmetz specialised in research upon electric lighting, with particular regard to loss of power. He held patents for electric motors and generators, and wrote text-books on electrical practice.

Steinway, HEINRICH ENGELHARD (1797-1871). A German piano manufacturer. Born at Wolfshagen, in the Harz Mts., his real name was Steinweg. He became a musical instrument maker in Brunswick, and his pianos were ranked among the finest in the world. Leaving his eldest son in charge of the German business, he settled in New York with his other four sons in 1850, and three years later established the firm of Steinway and Sons.

Stela or **STELE** (Gr. *stēlē*, upright post). Upright slab bearing sculptural designs or inscriptions. The word is also applied to a prepared rock-surface similarly inscribed. The most numerous

examples and the oldest date from ancient Egypt, but stelas have also been found in Greece, Asia, and S. America. They are either funerary, mostly in tomb-chambers, or votive, usually dedicated by kings or eminent personages, in temples and public places. Sculptured and inscribed stelas were produced in ancient China, both funerary, such as the Han tombs in Shantung, and votive, such as the Nestorian tablet at Hsian-fu. A remarkable series has been unearthed on Maya sites in Guatemala and in the Zapotec city of Monte Alban in S. Mexico. They were usually set up on the terraces or the stairway bases of pyramidal mounds.

Stella (Lat., star). Name by which Sir Philip Sidney addressed Lady Penelope Devereux, afterwards Lady Rich, in his love sonnets, Astrophel and Stella. It was also given by Jonathan Swift to Esther Johnson.

Stellarton. Town of Nova Scotia, Canada, on the East River. Served by the C.N.R., it is the centre of a coal mining district, and has one of the thickest known seams of coal (37 ft.). Pop. 5,300.

Stella's Sea Cow, or **STELLER'S S.C.** Large marine mammal of the order Sirenia, with a length of some 20 ft. First observed in the Bering Sea about 1840, it was so pursued by Russian whalers that within 30 years it was extinct.

Stellenbosch. Town of Cape Province, S. Africa. It is 31 m. E. of Cape Town, with which it is connected by rly. The chief buildings are the Dutch reformed



Stela engraved with a charter of Nebuchadrezzar I, king of Babylon, c. 1120 B.C.
British Museum



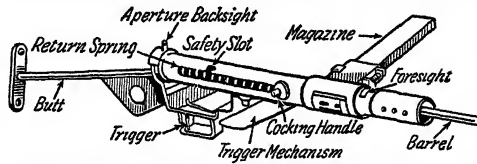
Stellenbosch, Cape Province. View showing the English church

shurch, a theological college, and, in addition to the university, colleges of various kinds. There are a number of 18th century houses in the Dutch style. Around are vineyards and fruit farms and in nearby streams considerable alluvial tin deposits have been worked. After Cape Town the oldest town in S Africa Stellenbosch was settled in 1680. It was named after a certain Simon van der Stell and his wife, whose name was Bosch. During the S. African War Stellenbosch was a British base. Officers removed from their commands at the front were frequently sent there, and so the term to be stellenbosched came into use for those who were regarded as unfit for their duties. Pop. (European), 7,474.

Stellenbosch, UNIVERSITY OF. Educational centre founded in 1918 as one of the five universities of South Africa. It took over Victoria College, Stellenbosch, and is governed by a council, senate, and convocation. There are, on the average, some 2,000 students in residence.

Stelvio Pass. Alpine pass in Italy. It is on the great highway from Milan to Innsbruck, connects Meran and the valley of the Upper Adige in Tirol with Bormio in

Stem. In botany, the axis of a plant, that which bears the flower, leaves, and root. It may be erect,



Sten Carbine. Diagram showing parts and explaining the mechanism of the automatic weapon used in the Second Great War

climbing, creeping, or pendulous, or may extend underground, in which case it differs from the roots in its capacity for bearing leaves. Though in shape usually cylindrical, it is sometimes triangular (water-plantain), square (Labiateae), or leaf-like (Phyllocactus). In early growth, a stem is usually soft and green, but later often becomes hard and woody, as with the trunks of trees. In trees, shrubs, and certain other plants, the stem persists all the year round; in herbaceous plants it dies down in the autumn, but the plant may have an underground stem, e.g. a rhizome, bulb, corm, or tuber. (See Botany; Cytology; Phloem; Plant.)

The word is also used for anything that resembles a stalk or

Britain and to utilise the large quantities of Italian 9 mm. ammunition captured in the Western

Desert. Suitable for mass production, the Sten has only 51 parts, of which only the bolt must be machined to precision limits; wherever possible joints are rough-welded and most of the manufacturing

processes can be carried out by unskilled labour. Fed from a box magazine, the Sten has an effective range of 200 yds., and a maximum rate of fire of 500 r.p.m.,

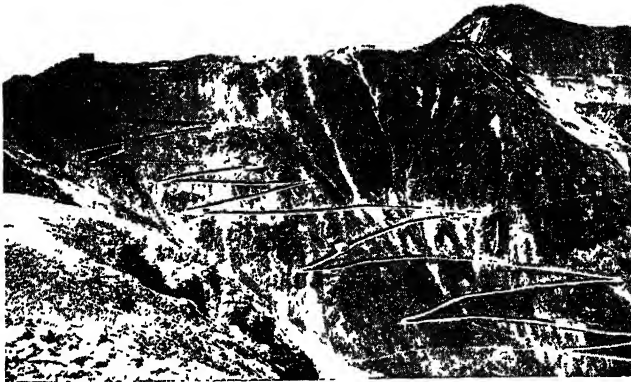


Sten Carbine. The correct way to hold this weapon when firing from the shoulder

though it can be adjusted to fire single shots. The Sten may be fired from either shoulder or hip. In the Second Great War over 3,000,000 Stens were used by the Allied regular armies, the Home Guard, R.A.F. Regiment, parachute troops, and commandos, or dropped by parachute to partisans in the occupied countries.

Stencilling (Old Fr. *estinceller*, to powder with stars). Printing, on paper or other prepared surface, of a pattern by means of a thin sheet of metal, cardboard, etc., pierced with spaces. When the ink or colour is brushed over the whole surface, it falls into the spaces and is excluded by the sheet elsewhere. Stencilling was the earliest method of printing coloured wallpapers, and is used in various forms of surface decoration.

Stendal. Town of E. Germany. In the *Land* of Saxony-Anhalt, it is situated on the Uchte, 60 m. W. of Berlin. The chief buildings are the old cathedral, S. Mary's church (1435-47), and the town hall (15th-16th century). The cathedral is a Gothic building dating from 1188-1250, and restored in the 19th century; its cloisters were used for a museum. There are remains of the town's fortifications. A railway junction, Stendal had manufactures of railway stock, textiles, tobacco,



Stelvio Pass. Windings of one of the highest carriage roads in Europe

the valley of the Adda, and carries the highest carriage road in Europe, the summit being 9,055 ft. in altitude. The road was built by the Austrians, 1820-24.

Stem. In philology, that part of a word which remains when the inflexional endings are removed. It is either identical with the root or formed from it by means of a suffix. Stems formed directly from the root are called primary; those added to an existing stem are secondary. See Philology; Root.

stem, such as the stem of a pipe. The stem of a feather (*q.v.*) is its main stalk. In music, it is the stroke drawn from the head of a note. In shipbuilding, it is the upright bar of iron or piece of timber at the fore end of a vessel, to which are attached the forward ends of the strakes. See Ship.

Sten Carbine. Light automatic infantry weapon. It was developed early in the Second Great War to meet the shortage of automatic firearms in Great

and leather. Founded in the 12th century, it was the capital of the old mark of Brandenburg, the residence of its rulers, and the seat of a bishop. A printing press was set up here in 1488. After the Second Great War it came within the Russian zone of occupation. Pop. 38,000.

Stendhal. Pen-name of Marie Henri Beyle, French novelist (1783-1842). He was born at Grenoble, Jan. 23, 1783. He

obtained a post in the ministry of war, witnessed the battle of Marengo, and then enlisting, rose to be adjutant to Michaud. During 1806-14 he held a

place in the commissariat, taking part in the campaign of 1812. From 1815 to 1821 he lived at Milan. Beyle then returned to Paris, and, having been consul at Trieste and Civit  Vecchia, 1830-41, died in Paris, March 23, 1842.

Stendhal, who wrote three novels, *Armance*, 1827; *Le Rouge et le Noir*, 1831; and *La Chartreuse de Parme*, 1839, notable for its account of the battle of Waterloo, may be regarded as the creator of that modern novel of psychological analysis which Bourget and d'Annunzio did so much to popularise. His critical works include *Histoire de la Peinture en Italie*, 1817; *De L'Amour*, an acute and cynical analysis of love; and *Racine et Shakespeare*, 1823, a defence of romanticism. *Consult* Lives, E. Rod, 1892; F. C. Green, 1939.

Stenness, STONES OR. Megalithic stone circles near Maeshowe, Orkney (*q.v.*). A 30-foot moat encloses 2½ acres, within which stands the Ring of Brogar, 342 ft. across, the largest cromlech in north Britain. Of the 60 original red-sandstone blocks, 13 are still erect, 23 lie prostrate. Of a smaller circle, once of 12 stones, two are erect, and one (19 ft.) lies near a ruined dolmen. Outside this stood the perforated Stone of Odin, mentioned by Scott in *The Pirate*.

Stenography (Gr. *stenos*, narrow; *graphein*, to write). System of writing in which words are expressed by abbreviations or by a system of characters taking less time to write than the normal alphabet. See *Shorthand*.

Stenotyping. Mechanical process of making shorthand notes.

This is done by means of a machine called a stenotype, so constructed that any one or any combination of letters or numbers can be printed at one time on one line of a strip of paper automatically fed into the machine. By using contractions for long words, it is possible to print very rapidly, and substitute printed characters for the normal shorthand devices.

Stentor. In Greek mythology, the herald of the Greeks in the Trojan War. He was famous for the loudness of his voice, which was said to equal that of thirty men. The English word stentorian is derived from his name.

Step. Word used in a number of senses. It is the rung of a ladder or part of a stairway. In machinery, a series of offsets or parts resembling the steps of stairs are called steps. It is also the name for a bearing at the bottom of a vertical shaft. In seamanship it is a frame of wood or metal intended to receive an upright shaft, *e.g.* the framing at the bottom of a mast, which is said to be stepped.

In combination the word is used in such expressions as stepfather, etc., indicating relationship by marriage and not by blood.

A step gauge is a compound plug gauge consisting of a number of short cylindrical gauges of graduated diameters on the same axis.

Stepanakert. Capital of Nagorno Karabakh (*q.v.*), a province of Azerbaijan S.S.R.

Stephanome (Gr. *stephanos*, wreath; *nomos*, rule). Meteorological instrument for measuring the size of haloes, etc. Invented by P. G. Tait, it consists of a graduated rod with a sliding bar with an outer and inner pair of points. These points are made to coincide with the ends of the diameter of a halo being measured.

Stephen. Saint and first Christian martyr. After the death of Jesus he joined the followers of the new faith in Jerusalem. One of the seven chosen to look after the poor (Acts 6), he was a man "full of faith and the Holy Ghost," and took a prominent part in controversy. His words made his enemies angry, and he was brought before the council. The speech given in Acts 7 did not save him, and he was stoned to death. S. Stephen's Day is Dec. 26.

Stephen (c. 1097-1154). King of England. A younger son of Stephen, count of Blois, and Adela, a daughter of William the Conqueror, he lived in boyhood at the court of his uncle Henry I. Although he had sworn to help

Henry's daughter, Matilda, to obtain the throne on her father's death, when that event occurred, Dec. 1, 1135, Stephen put himself forward and was crowned, his brother, Henry, bishop of Winchester, being one of his chief supporters. The reign was a period of anarchy, due in part to Stephen's subservience to the great barons, and in part to his folly in imprisoning the bishops who controlled the administration. Rebellions broke out, and in 1139 Matilda appeared to claim the throne. In 1141 Stephen was captured, but soon he was free again and the civil war continued for 12 years. When Matilda left the country her place was taken by her son, Henry, and in 1153 the treaty of Wallingford provided that he should succeed Stephen, who died Oct. 25, 1154. This unsuccessful ruler is in character one of the most attractive kings of England. He married Matilda, countess of Boulogne. His elder son, Eustace, predeceased him in 1153; the younger, William, called the Clito, appeared later in arms against Henry II.

Stephen (977-1038). King of Hungary and saint. The son of Geza, duke of Hungary, he changed his name from Wajk to Stephen at his conversion and baptism in 997. By marriage with the Bavarian princess Gisela he secured German aid in christianising Hungary. In 998 he took the title of king, and in 1001 received from Pope Sylvester II the famous iron crown. His reign was spent in wars against the heathen, and in 1030 he repelled an invasion by the emperor Conrad II. He died Aug. 30, 1038, and was canonised in 1083.

Stephen. Name of nine popes. Stephen I, pope 254-257, decided against S. Cyprian of Carthage that baptism by heretics was valid. Stephen II is noticed below. Stephen III, a Sicilian monk, pope 768-772, was elected by the overthrow of two lay claimants to the papacy. Stephen VI was strangled after reigning six months, 896-897. The election in 752 of a Stephen who died before his consecration has caused confusion in the numbering; many lists count the unconsecrated pope as Stephen II, and thus make ten Stephens.

Stephen II (d. 757). Pope from 752 to 757. A Benedictine monk of Rome, his reign saw the establishment of the papal monarchy. He obtained the help of Pepin the Short, the Frankish king, against Aistulf, king of the Lombards, who sought to conquer all Italy, and on



"Stendhal,"
French novelist

Aistulf's death, 756, he supported Desiderius in his claim to the Lombard crown. Desiderius retained Bologna, Imola, and other cities, but Stephen consolidated papal rule over Ravenna and the cities formerly under the Byzantine exarch. He died April 26, 757. *Consult* Beginning of the Temporal Sovereignty of the Popes, L. M. O. Duchesne, 1908.

Stephen, SIR JAMES FITZJAMES (1829-94). British judge and author. Born at Kensington, March 3, 1829, a son of the historian, Sir James Stephen (1789-1859), he was educated at Eton, King's College, London, and Trinity College, Cambridge. Called to the bar in 1854, he helped to codify Indian law, 1869-72, and was a judge of the high court from 1879 to 1891, when he received a baronetcy. He wrote for *The Saturday Review* and *The Pall Mall Gazette*, while his works on legal subjects include *Digest of the Law of Evidence*, 1876 (12th ed. with additions, 1947), and *History of the Criminal Law of England*, 1883. He died at Ipswich, March 11, 1894.

Stephen, SIR LESLIE (1832-1904). English man of letters. Born in London,



Sir Leslie Stephen,
English man of letters
Beaconsfield

but steadily developed an agnostic attitude and in 1875 relinquished them. From 1865 he was contributing to *The Saturday Review*, the newly founded *Pall Mall Gazette*, and *The Cornhill Magazine*. His connexion with the last-named, of which he became editor in 1871, led to his being asked by George Smith (*q.v.*) in 1882 to edit *The Dictionary of National Biography*. Knighted 1902, he died Feb. 22, 1904.

His works include *Hours in a Library*, 1874-79; *History of English Thought in the 18th Century*, 1876; *The Science of Ethics*, 1882, in which are summed up his philosophic and religious

conclusions; *An Agnostic's Apology*, 1893; biographies of Johnson, Pope, Swift, George Eliot, and Hobbes in the *English Men of Letters* series. His mountaineering activities are reflected in *The Playground of Europe*, 1871. Among his friends were Stevenson and Henley. Stephen's daughters were Vanessa Bell and Virginia Woolf. *Consult* Life and Letters, F. W. Maitland, 1906.

Stephens, JAMES (c. 1825-1901). Irish agitator. A Kilkenny man, he was deeply implicated in the disturbances of 1848. He took refuge in Paris and in 1853, with John O'Mahoney, founded the Irish Republican Brotherhood, or Fenian Society (*q.v.*). In 1865 he attempted a rising in Ireland, but it failed, and he was imprisoned in Dublin Castle, from which he escaped and fled to America. Subsequently he lived in retirement in France and Ireland, dying at Blackrock, April 29, 1901.

Stephens, JAMES (b. 1882). Irish poet. As a Dublin youth he worked in a lawyer's office and became an ardent nationalist whose writing was steeped in Celtic legend. Publication in 1912 of *The Crock of Gold* made his name, and there followed *Irish Fairy Tales*, and *Deirdre*, both 1923; *In the Land of Youth*, 1924; *Kings and the Moon*, 1938. A friend of Yeats and others in the Irish literary revival, Stephens was also a critic and broadcaster.

Stephenson, GEORGE (1781-1848). British engineer. Born at Newcastle-upon-Tyne, June 9, 1781, the son of a colliery fireman, he became assistant to his father at the age of 14, learning to read and write at a night school. In 1808 he contracted with two others to work the engines of Killingworth pit, and he dismantled his engine once a week until he was thorough master of its construction. In 1812 he was appointed engine-wright to the colliery, and in 1815 invented a safety lamp for miners, which brought him a grant of £1,000.

The rapid progress of the steam engine directed Stephenson to the work with which his name is always associated. Receiving financial assistance, he built his first locomotive in 1814; this could haul 30 tons at 4 m.p.h. In

1815 he made improvements in its construction, including the use of the steam blast. The failure of steam locomotives to work on any real gradient on the roads turned Stephenson's attention to the construction of railroads, and in 1819 he superintended the laying down of a short line at Hetton Collieries, and in 1823 the line between Stockton and Darlington.

The first locomotive, built by Stephenson, to use this line reached a speed of 16 m.p.h. and weighed eight tons. In 1826 he began the construction of the Liverpool and Manchester rly., and in 1829 he built the Rocket (*q.v.*). He was appointed chief engineer to a number of railways, and was consulted on practically every important line constructed. In 1847 Stephenson became president of the Mechanical Engineers. The most modest of men, he died Aug. 12, 1848, and was buried at Chesterfield. *See* Locomotive; Steam Engine; *consult* Life, S. Smiles, 1864.

Stephenson, ROBERT (1803-59). British engineer. Son of George Stephenson, he was born at Willington Quay,

near Newcastle-upon-Tyne, Oct. 16, 1803. He helped his father to survey the Stockton and Darlington rly., 1821, and then entered Edinburgh university. After George Richmond



After George Richmond

Poor health compelled him to go abroad, and in 1824 he accepted an offer to superintend gold and silver mines in Colombia. On his return in 1827 he assisted his father in building the famous Rocket, to which he suggested many improvements, and constructing the first railway into London, that from Birmingham, 1833-38. The Menai tubular bridge, the Victoria bridge over the St. Lawrence at Montreal, and many others were built by Stephenson. He was elected M.P. for Whitby, 1847, and represented the town till his death. President of the Institute of Civil Engineers, 1856-57, he died Oct. 12, 1859, and was buried in Westminster Abbey. His cousin George Robert Stephenson (1819-1905) also built bridges. *See* Locomotive.

Stepney. Met. bor. of the co. of London. It has Bethnal Green on the N., the City and Shoreditch W., Poplar E., and extends on the S. to



George Stephenson,
British engineer
After Briggs

the Thames. It contains the Tower, the Mint, St. Katherine's, London, and Regent's Canal docks, Shadwell Basin, and comprises



Stepney arms

Limehouse, Mile End, White-chapel, and St. George's. In the church of S. Dunstan, rebuilt by Wren, were buried Sir Thomas Spert, founder of Trinity House (*q.v.*), and Sir Henry Colet, father of Dean Colet, sometime vicar of Stepney. There are many charitable institutions, including Dr. Barnardo's Homes (*q.v.*) and the London Hospital. Three M.P.s were elected until 1950, and thereafter one. Since 1895 Stepney has given its name to a suffragan bishopric. The exceptional damage suffered by this borough in air raids, 1940-41 and 1944-45, reduced its pop. by about half to 109,000 but offered opportunity for drastic re-planning.

Stepniak, SERGIUS (1852-95). Russian writer and revolutionary leader. He was born in southern Russia of noble descent, his proper name being Sergius Michaelovitch Kravchinsky. When he was little over twenty he was arrested owing to his association with a known group of Nihilists. Before he was thirty he left Russia, and lived first in Switzerland and later in England, where he became prominent as a writer and lecturer. His best known works were *Underground* Russia, 1882; *The Career of a Nihilist*, a novel, 1889; and *King Stork and King Log: A Study of Modern Russia*, 1896. He was killed at a rly. level crossing at Chiswick, Dec. 23, 1895.



Sergius Stepniak,
Russian writer

Steppe. Vast grassy plain of S.E. Russia and W. Siberia. Owing to the little rainfall, or, in some cases, to the porous character of the soil, trees are not found except along the banks of rivers, or where there are permanent supplies of moisture. Grasslands like the steppes are found in similar positions in other continents, *i.e.* in interior regions of temperate latitudes, where the rainfall is light and mainly confined to spring and early summer. See *Pampas*; *Prairie*; *Siberia*.

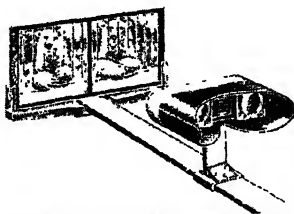
Sterculiaceae. A Family of herbs, shrubs, and trees. Natives of tropical and sub-tropical regions, they have mostly alternate leaves and regular flowers. They are mucilaginous, and the bark of the woody species contains bitter and astringent principles useful in medicine. *Sterculia tragacanthae* yields gum tragacanth. The order also includes cocoa (*Theobroma cacao*), kola (*Cola acuminata*), etc.

Stère (Gr. *stereos*, solid). Unit of cubic measurement in the metric system. It is one cubic metre, and equals a kilolitre, or 35·3145 cubic feet. It is used in measuring firewood. See *Metric System*.

Stereochemistry (Gr. *stereos*, solid). Branch of chemistry dealing with the arrangement in space of the atoms within the molecule, and especially with those kinds of isomerism—known as stereoisomerism—which depend upon differences in this arrangement. Pasteur first called attention to the existence of compounds, *e.g.* tartaric acid, which are known in different forms, that, although alike in chemical and most physical characters, exhibit a difference in optical properties.

Stereochemistry has been of special importance in connexion with the study of the sugars and allied compounds, and it has also explained diverse phenomena in chemistry (*q.v.*).

Stereoscope (Gr. *stereos*, solid; *skopein*, to view). Optical instrument which presents to each eye separately a flat image, either a drawing or a photograph, of an object as seen by the respective eyes, and so producing the effect of relief. The instrument was in-



Stereoscope. Open form of the optical instrument, showing how two almost identical images are exposed

vented by Wheatstone in 1838, and the separate pictures were reflected by mirrors. The use of two prism eyepieces was due to Brewster, 1849, and, as modified by making the prisms in the form of sections of convex lenses, has been generally adopted. The open stereoscope was due to O. W. Holmes in 1861.

In making stereoscopic views by photography, two negatives are made simultaneously by means of a camera which has two lenses placed a few inches apart, or by shifting the camera approximately 2½ in. to left or right in the same plane between two successive exposures. The pictures are transposed in printing, the positive from the left-hand photograph being placed on the right and vice versa. Stereoscopic pictures may be viewed as positive prints by reflected light or as transparencies by transmitted light. The latter gives the best effect, especially with coloured pictures.

Stereotyping. Method of reproducing for printing a surface of movable type or relief printing blocks. Two operations are involved, the moulding of the matrix from the type, and the casting of the stereotype from the mould. It is executed by making in plaster of Paris or papier-maché by extreme pressure heavy impressions of the surface of a forme containing type or illustrations, or both, such as a page of this Encyclopedia, and a mould or matrix is thus secured into which molten metal is poured, producing a new metal surface with characters in relief identical with the original. Many printing plates can be produced from one papier-maché mould, and by means of this process huge editions of newspapers, produced within the space of an hour or two, become possible.

While the principle of making stereotypes for ordinary flat bed printing and newspaper printing is the same, with the latter the cast, instead of being a plane with the upper surface in relief, is produced in semi-cylindrical form or crescent-shaped, and with a periphery corresponding to the cylinder of the newspaper rotary printing press. See *Electrotype*; *Forme*; *Linotype*; *Lithography*; *Monotype*; *Newspaper*; *Printing*.

Stereum hirsutum. Leathery fan-shaped fungus belonging to the family Thelephoraceae. It is



Stereum hirsutum. Upper side of the fungus that grows upon the branches and trunks of trees

common on the trunks and branches of trees, and is of a dull yellow tint, becoming paler and greyish. The faintly zoned upper side is covered with a coarse velvet, and the bright coloured underside is smooth. The upper side may be almost wholly attached to the tree, only a portion of the margin being free and growing out; occasionally it may be growing quite free and assuming a funnel shape. The spores are produced on the smooth under surface. Its effect on oak timber is to produce the condition known as "piped" or "flywood."

Sterilisation (Lat. *sterilis*, barren). Term used in bacteriology and chemistry for the process of destroying bacteria.

The sterilisation of food forms an important part of its preparation for human consumption. Water can be sterilised by boiling or distillation, and milk by boiling or exposing to superheated steam. Boiling or exposing milk to great heat alters its character and its food value, and its sterilisation is better carried out by pasteurisation (*q.v.*). Milk can also be sterilised by the addition of antiseptic substances, *e.g.* boric acid; and has been sterilised by electricity and by supersonic vibrations.

In surgery it is important that all instruments and materials used in operating shall be sterilised. Boiling in water, the use of the autoclave (*q.v.*) in which steam under pressure is used, and the use of disinfectants and antiseptics, *e.g.* phenol and iodine, are the chief means of sterilisation in surgery. Instruments plunged in an open flame are sterilised.

All bacteria can be killed by heat, especially moist heat, but many will survive the greatest cold. For the study of bacteria it is necessary to obtain a pure culture upon which they can be grown artificially. Such substances are sterilised by heat. See Bacteriology; Food Preservation.

Sterilisation. In eugenics, the rendering incapable of reproduction of human beings or animals without interfering with their sexual life. In the male it is achieved by tying off the sperm-conducting tubes (in contrast to castration, where the testes are removed, and the animal thereafter has no sexual life). Sterilisation is sometimes practised with valuable animals when it is desired that they should not sire from unchosen stock, but is generally performed for commercial reasons. It is little practised in

medicine, though many physicians advocate its application to prevent the reproduction of individuals with transmissible flaws. Sterilisation of females is carried out by tying off the fallopian tubes; this is done in women when for some medical reason they should not become pregnant.

Sterility. Inability of animals and plants to produce offspring. Many reasons have been assigned for this defect, but apparently it is often due to changed conditions of existence, as with wild animals in zoological gardens; though distinct families of animals exhibit considerable differences in this respect. As a rule, hybrids resulting from the pairing of distinct species are sterile; on the other hand, when the parents are of different races or varieties of the same species, the hybrid shows greater fertility. Many plants are sterile when fertilised with their own pollen, while producing seed abundantly under the influence of pollen conveyed from another individual of the species; other varieties are habitually fertile when self-pollinated.

Sterling. Term used in three senses: (a) To describe 22 carat gold, *i.e.* a mixture of 22/24 pure gold and 2/24 alloy, and 18½ carat silver, *i.e.* a mixture of 37/40 pure silver and 3/40 alloy; these are the standard gold and silver formerly used in British coinage; (b) as an adjective, to indicate a degree of excellence comparable to that of sterling gold and sterling silver; and (c) as a noun, to denote the British pound, and as an adjective, to distinguish things pertaining to the British pound (for example, sterling exchange, sterling loan, etc.). The name may be derived from the Easterlings, German merchants who settled in London in the 14th century and circulated coins rather better than those generally used; or from an early silver penny—called the sterling because it bore starlings as a device and was noted for its intrinsic worth.

Sterling Area. Term applied to countries which normally pay for imports by drafts on British banks, and make available to British banks dollars and other non-sterling currencies received for goods exported. In September, 1948, the sterling area or sterling bloc proper included the U.K., the dominions of Australia, New Zealand, S. Africa, and Eire, Burma, Iraq, Iceland, Ceylon, Hong Kong, Malaya, the African colonies, dependencies, and man-

dated territories, Trinidad, Bermuda, British W. Indies, and certain other mandated territories. In these countries there was very close cooperation through the bank of England in all matters relating to payments to and from other areas. In addition, a number of other countries, including India, Egypt, Brazil, Argentina, Uruguay, Iran, the Belgian Netherlands, and the Italian territories, agreed to receive payment in sterling for stated amounts of their total exports. One effect of the war was to increase the "sterling balances" of the members of the pre-war sterling group, which included India, from about £200 millions to more than £2,650 millions, and the sterling balances of other countries to £618 millions.

Sterling, ANTOINETTE (1850-1904). American singer. She was born at Sterlingville, New York,



Antoinette Sterling,
American singer

Jan. 23, 1850, and studied singing in New York and under Marchesi, Viardot-Garcia, and Manuel Garcia, returning to New York in 1871 and soon becoming known as a leading contralto concert singer. She made her first London appearance in 1873, and thereafter remained in England, though touring the U.S.A., 1875, and Australia, 1893. Her dramatic sense made her a powerful ballad singer, and among her most famous songs were *The Lost Chord* (Sullivan), *The Better Land* (Cowen), and *The Sands of Dee* (Hullah). Married to John Mackinlay, 1875, she died at Hampstead, Jan. 9, 1904.

Sterling, JOHN (1806-44). Scottish author. Born July 20, 1806, at Kames Castle, Bute, the son of Captain Edward Sterling (1773-1847), who became a leader writer on *The Times*, he was educated at Glasgow university and Trinity College, Cambridge.



John Sterling,
Scottish author
After Delacour

In 1828 he became for a time part proprietor of *The Athenaeum*. Soon after his marriage in 1830 he had the first attack of the lung trouble which eventually proved fatal. In search

of health he went to St. Vincent as manager of a sugar plantation, but after fifteen months he returned to England, took orders, and for a short time was a curate. He died Sept. 18, 1844. His *Essays and Tales* were published in 1848, but he would be forgotten but for the biography by his friend Carlyle.

Stern. Rear part of a vessel or boat. It meant originally the helm or tiller, the word being related to steer. *Pron.* as spelt. See Ship.

Stern, DANIEL (1805-76). Pseudonym of Marie Catherine Sophie de Flavigny. Born at Frankfurt, Dec. 31, 1805, she married in 1827 the Comte d'Agoult, but deserted him for Liszt. the famous composer, to whom she bore three daughters. The eldest child married Emile Ollivier, and the youngest married Hans von Bülow and subsequently Wagner. Daniel Stern's best work is *Moral Sketches*, published in 1849. She died March 5, 1876. See *Lettres à Daniel Stern*, G. Mazzini, 1872.

Stern, GLADYS BRONWYN (b. 1890). British writer. Born of Jewish descent in London, June 17, 1890, she was educated in Germany and Switzerland, and studied at the R.A.D.A. Her first published novel, *Pantomime*, appeared in 1914, and she achieved fame with *Tents of Israel*, 1924 (a brilliant study of a Jewish family) which, in collaboration with Frank Vosper, she dramatised for Mrs. Patrick Campbell, as *The Matriarch*, 1929. A prolific writer of novels, short stories, and film scenarios, her other works included *A Deputy Was King*, 1926; *Debonair*, 1928 (dramatised, 1930); *Mosaic*, 1930; *Oleander River*, 1937; *The Young Matriarch*, 1942. She collaborated with Sheila Kaye-Smith in *Talking of Jane Austen*, 1943.

Stern, OTTO (b. 1888). German-born American physicist. He was born at Sorau, Feb. 17, 1888, and educated at Breslau university. Successively lecturer in

physics at Zurich and Frankfurt, he became professor at Rostock, 1921-22 and at Hamburg, 1923-33. Of Jewish stock, he was attacked by the Nazis, and he eventually went to the U.S.A., as professor at the Carnegie institute of technology at Pittsburgh. As a result of his work on extensions of Planck's quantum theory, he was awarded the Nobel prize for physics, 1943.

Sterne, LAURENCE (1713-68). British humorous author. He was born Nov. 24, 1713, at Clonmel, Tipperary, and on his father's death in a duel was sent by relatives to Jesus College, Cambridge, where he graduated in 1736. Ordained in that year, he received the living of Sutton-in-the-Forest, near York, remaining for 20 years. When he was 45, in 1759, the first portion of *The Life and Opinions of Tristram Shandy* appeared. The book was an immediate success, and Sterne proceeded to London to enjoy the fame it had brought, to which his audacious wit was to add. Presented to the

though this too often degenerates into sentimentalism. Sterne's works were ed. in 6 vols., G. Saintsbury, 1894. His letters, ed. L. P. Curtis, appeared in 1935. The best lives are by P. Fitzgerald, rev. ed. 1896, and W. L. Cross, 3rd ed. 1930, while there is a sketch in P. Quennell's *Four Portraits*, 1945. See *English Literature*; *Novel*; *Tristram Shandy*.

Stern Gang. Terrorist band operating in the Middle East. It was formed in 1940 by Abraham Stern (d. 1941) from extreme elements of Irgun (*g.v.*) after that organization had made a wartime truce with Great Britain. The Stern Gang, which sometimes styled itself the *Fighters of Freedom for Israel*, co-operated with the Axis and by acts of violence and sabotage attempted to hinder Allied war plans in the Middle East. It executed most of the terrorist acts in Palestine, 1942-47; two members, condemned and executed for the crime Jan., 1945, murdered Lord Moyne, resident minister in the Middle East in Cairo, Nov. 5, 1944. British troops were murdered, and bomb outrages carried out. After the withdrawal of the British, the Gang extended its hostility to U.N. representatives, and proclaimed its responsibility for the murder of Count Bernadotte, U.N. mediator, Sept. 17, 1948. The Israeli govt. outlawed the organization, arrested some 200 members, and on Sept. 30 captured its leader, Nathan Yellin, and his deputy. Sentenced, Feb. 10, 1949, to 8 and 5 years' imprisonment respectively, they were immediately freed under an amnesty, and Yellin took his seat in the constituent assembly as the only representative of the *Fighters' party*, into which the Stern Gang had been transformed.

Sternhold, THOMAS (c. 1500-49). English versifier of the Psalms. A small landed proprietor in Hampshire, he is believed to have been born at Southampton, and educated at Christ Church, Oxford, and was groom of the robes to Henry VIII. He was the author, with John Hopkins (d. 1570), of metrical versions of the Psalms, which enjoyed great popularity. The first edition, c. 1547, contained 19 psalms, and the second, 1549, had 37 by Sternhold and seven by Hopkins. The complete volume, 1562, had no rival until the versions of Tate and Brady. Sternhold died Aug. 23, 1549.

Sternum. Bone in front of the chest connecting the ribs. See *Breast-bone*; *Rib*.



"Daniel Stern,"
German author
From a sketch by
Claire-Christine



After Sir Joshua
Reynolds

perpetual curacy of Coxwold, he proposed to himself a life of literary activity, but dissipation soon affected his health, and periods of travel were necessary for recuperation. He visited Paris, and in its salons was lionised as he had been in London. His foreign peregrinations are reflected in later volumes of *Tristram Shandy*, of which the last came out in 1767, and in *Sentimental Journey* through France and Italy, published three weeks before his sudden death in London, March 18, 1768.

Sterne's humour, though frequently indecent, is of a high order, and finds expression in the character-drawing of Uncle Toby, Corporal Trim, and the Widow Wadman. He is also a master of pathos,



G. B. Stern,
British writer

Steroid. Generic term for any one of a group of chemical compounds including the sterols, bile acids, heart poisons, sex hormones, and saponins. Steroids are regarded as derivatives of the hydrocarbon cyclopentanoperhydrophenanthrene. The steroid group includes the hormones oestrogens or true ovarian hormones, progesterin, the androgens or testicular hormones, and the hormones of the suprarenal cortex.

Stertor OR STERTOROUS BREATHING. Sound resembling snoring, caused by vibration of the soft palate when paralysed. It is most often observed in persons suffering from an apoplectic stroke.

Stesichorus (c. 630-555 B.C.). Greek lyric poet. He was born at Himera in Sicily, his real name being Tisias, changed to Stesichorus (marshal of choruses) because of his occupation. His poetry, written in the Dorian dialect, was choral, and his themes were taken from the epic cycle. There is a story that he was struck blind by Helen for an attack upon her in one of his chorus songs, but recovered his sight after recantation. See Ode.

Stethoscope (Gr. *stēthos*, chest; *skopein*, to look into). Medical instrument invented by R. T. H.

Laennec. It enables the physician to hear sounds originating in the heart or lungs, or other parts of the body. Laennec's instrument was a hollow wooden tube expanded at each end. The modern form of stethoscope consists of a chest piece, from which lead two rubber tubes terminating in bone or metal ear pieces which the physician places in his ears, the chest piece being applied to the body over the organ

Stethoscope. The modern medical instrument

which is to be auscultated. See Laennec, R. T. H.

Stettin (Pol. *Szczecin*). City on the Baltic Sea. It is situated 80 m. N.E. of Berlin, and near the mouth of the Oder, and was until 1945 Germany's chief Baltic port. It lies in the part of E. Germany placed under Polish administration under the Potsdam agreement, 1945. It contains a palace of the former Pomeranian dukes, with a crypt dating from 1577, a 15th century town hall, and the churches of S. James (13th-14th century) and S. John



Stettin. Air view of the city on the Oder which was formerly the chief Baltic port of Germany.

(14th century). Most of the fortifications were pulled down in 1873.

Stettin was one of Germany's foremost industrial towns, with a huge shipyard, cement, sugar, chemical, and other industries, and a large entrepôt trade. It was a member of the Hanseatic League from 1278, and belonged to Sweden from 1648 to 1720, when it fell to Prussia. Bombed by both the R.A.F. and the Russian air force during the Second Great War, Stettin was captured from the Germans by Russian troops on April 26, 1945. Pop. 270,747.

Stettiner Haff. Lagoon of the Baltic Sea. It receives the waters of the Oder and outflows by the Swine, which separates the islands of Wollin and Usedom, the Peene, and the Dievenow.

Stettinius, EDWARD REILLY (1900-49). U.S. politician. Born in Chicago, Oct. 22, 1900, he was educated at Pomfret, Conn., and Virginia university. After working in a motor factory, he became vice-president of General Motors, 1931, and in 1934 joined the U.S. Steel corporation, rising to be chairman. In 1939 he was made chairman of the war resources board. He served as lease-lend



Edward Stettinius, American politician

tary on Cordell Hull's retirement. Stettinius was the second youngest secretary of state in U.S. history. In 1945 he was appointed American representative on the security council of the U.N., and served as chairman of the U.S. delegation in the general assembly of the U.N., 1945-46. He published *Lease-Lend: Weapon for Victory*, 1944; *Roosevelt and the Russians: the Yalta Conference*, 1949. Having returned to business, he died Oct. 31, 1949, at Greenwich, Conn.

Steuben, FRIEDRICH WILHELM AUGUSTUS, BARON VON (1730-94). German soldier of fortune. Born at Magdeburg, Nov. 15, 1730, he saw service during the Seven Years War, and in 1778 offered his sword to the American Colonies in their struggle with Britain. Appointed



Baron von Steuben, German soldier of fortune

instructor-general, he devoted himself to the task of reorganizing the raw colonial volunteers. Subsequently he received a command in the field and took a prominent part in the reduction of Yorktown in 1780. His services were rewarded with a pension and a grant of land. The latter was in New York State, near Utica, and there, calling it Steuben township, he lived until his death, Nov. 28, 1794.

Stebenville. City of Ohio, U.S.A., the co. seat of Jefferson co. It stands on the Ohio river, 44 m. W.S.W. of Pittsburg, and is served

by the Pennsylvania and other rlys. It lies in a natural gas and coal mining region, and manufactures glass, iron and steel ware, foundry and machine-shop products, paper, and flour. It assumed its present character after the sinking of the Liberty coal-shaft in its main street in 1856. Steubenville was founded in 1797, and became a city in 1851. It was built on the site of Fort Steuben, a fort erected in 1787 and named after Baron von Steuben (v.s.). Pop. 37,651.

Stevedore (Span. *estivador*, packer). Man who undertakes the loading and unloading of a ship's cargo. The master of a vessel is supposed to be a competent stevedore, but as a general rule a harbour official is appointed.

Stevenage. Market town and urban district of Herts, England. It is situated 28 miles N. of London on the Great N. Road and the main rly. from King's Cross. The town has several old and picturesque buildings, including the church of S. Nicholas, mainly early English. Alleyne's grammar school for boys was founded here in 1558. At the southern end of the town are situated Six Hills, or tumuli, standing on a narrow strip of land alongside the Great N. Road. Towards the end of Sept. an annual fair is held in the main street, when traffic is diverted. Market day Sat. Pop. 6,330.

In 1946 the minister of Town and Country Planning designated almost all the urban district, together with small parts of the rural districts of Hertford and Hitchin, as the site of a new town of 80,000 pop. Some 600 acres of the area were set aside for industrial development. There were to be six neighbourhood units, each with its own local shopping area and infant schools; and a central civic, business, and shopping area, serving all of them.



Stevenage, Hertfordshire. Parish church of S. Nicholas

Stevens, ALFRED (1818-75). British sculptor. Born at Blandford, Dorset, Jan. 28, 1818, he

studied painting in Italy, but while there turned to sculpture, and about 1841 entered Thorwaldsen's studio. He returned to England in 1843, and in 1856 began his greatest work, the Wellington monument in S. Paul's cathedral. This was left unfinished at his death in London, May 1, 1875. Stevens was the perfect modern interpreter of Renaissance art ideals.



Alfred Stevens, British sculptor

Stevens, ALFRED (1828-1906). Belgian painter. Born in Brussels, May 11, 1828, he studied under



Alfred Stevens, Belgian painter

Navez there, and Roqueplan in Paris. In 1849 he painted his first notable picture and he later frequently exhibited in the Paris Salons. He painted the elegant bourgeois life of his time, chiefly interior scenes, with furniture, costumes, etc., faithfully rendered. He died in Brussels, Aug. 24, 1906.

Stevens, JOHN (1749-1838). American inventor. He was born in New York and educated at Columbia university. Admitted to the New York bar in 1771, he later joined the revolutionary army, rising to the rank of colonel. During 1777-82 he was treasurer to the state of New Jersey. In 1784 he built a home on what was at that time the island of Hoboken, and lived there until his death. Having purchased the New York ferry, he became interested in the problems of safe and speedy navigation across the Hudson, and in 1788 he built the first multitubular boiler for marine engines and in 1802 the first steamboat with underwater propellers. He petitioned congress in 1790 to introduce a new patent law, which was the foundation of the modern patent system of the U.S. In 1832 he com-

pleted the first rly. across New Jersey. Stevens died March 6, 1838.

Stevens OR **STEPHENS, JOHN** (d. 1726). British scholar. Of supposed Irish nationality, he was a captain in the army of James II in his unsuccessful campaigns in Ireland, and, escaping attainer, made his way to London, where from about 1695 until his death, Oct. 27, 1726, he supported himself by writing, notably A Brief History of Spain, 1701, and translating from Spanish, Portuguese, Latin, and French. His translations include Bede's Ecclesiastical History, Dugdale's Monasticon Anglicanum; the comedies of Quedo, 1707; and Don Quixote, 2nd ed. 1706. He also compiled a Spanish-English and English-Spanish Dictionary, 1706.

Stevenson, HENRY WILLIAM (1874-1944). British billiards player. Born at Hull and originally a marker, he came to London as a professional in 1894, and won the professional championship seven years later, defeating Dawson by 9,000 to 8,406. Dawson regained the title in April, 1901, but in Nov. Stevenson was declared champion without a contest. He was again beaten by Dawson in 1903, but regained the championship in 1909. He was beaten by M. Inman in 1919. On June 12, 1944, Stevenson died.

Stevenson, ROBERT (1772-1850). Scottish civil engineer. He was born in Glasgow, June 8, 1772, and educated at the

Andersonian institute, Glasgow, and Edinburgh university. He learnt lighthouse engineering from his stepfather, Thomas Smith. In 1797 he was appointed engineer to the Scottish lighthouse board, a position which had been filled by his stepfather. Robert Stevenson erected a number of important lighthouses, the most famous of which was the Bell Rock. Many unsuccessful attempts had been made to erect a lighthouse on the rock, and Stevenson's success was a triumph over public opposition as well as an engineering success. Stevenson made many improvements in the methods of lighting lighthouses and lightships. He also designed many bridges, and the E. approach roads to Edinburgh, and was honoured by many British scientific institutions. He died July 12, 1850,



Robert Stevenson, Scottish civil engineer
From a bust by S. Joseph

He was born in Glasgow, June 8, 1772, and educated at the Andersonian institute, Glasgow, and Edinburgh university. He learnt lighthouse engineering from his stepfather, Thomas Smith. In 1797 he was appointed engineer to the Scottish lighthouse board, a position which had been filled by his stepfather. Robert Stevenson erected a number of important lighthouses, the most famous of which was the Bell Rock. Many unsuccessful attempts had been made to erect a lighthouse on the rock, and Stevenson's success was a triumph over public opposition as well as an engineering success. Stevenson made many improvements in the methods of lighting lighthouses and lightships. He also designed many bridges, and the E. approach roads to Edinburgh, and was honoured by many British scientific institutions. He died July 12, 1850,

ROBERT LOUIS STEVENSON

L. Cope Cornford, *Author of Stevenson, in Modern English Writers*

See the articles English Literature; Essay; Novel; Short Story, etc.; also the biographies of Meredith and other contemporaries, and the entries on Stevenson's works, e.g. Catriona; Jekyll and Hyde; Treasure Island. See also Monterey

Robert Lewis Balfour Stevenson was born on Nov. 13, 1850, at 8, Howard Place, Edinburgh, the only child of Thomas Stevenson, civil engineer, whose father, Robert, was a famous lighthouse engineer, and of Margaret, daughter of James Balfour, minister of Colinton. The novelist chose in practice to alter the spelling of his second name and to drop the third.

Louis was a delicate child, and suffered intermittently from illness all his life; and the volume and finished excellence of his work are a monument to his courage and tenacity.

From the age of eight to the age of seventeen he attended various private schools; and in his vacations travelled with his father upon professional journeys in Scotland, and went abroad with him. Concerning this period of his life, Stevenson wrote in *Memories and Portraits*: "All through my boyhood and youth I was known and pointed out for the pattern of an idler; and yet I was always busy on my own private end, which was to learn to write." He entered Edinburgh University at 17, studied law, read widely in English and French, and formed many friendships. Early in 1875 he came to know William Ernest Henley, who was then a patient in the Edinburgh Old Infirmary; and thus began a friendship which, in spite of a certain estrangement towards the end, did in fact endure till death.

Early Literary Work

In 1875 Stevenson was called to the bar; but already he had achieved a place of his own in letters. The essays collected under the titles of *Familiar Studies of Men and Books* and *Virginibus Puerisque*, proved his title to an admirable craftsmanship. In 1876, after visiting Fontainebleau, where his cousin, R. A. M. Stevenson, the art-critic, was then living, and travelling with Sir Walter Simpson upon the canals of Belgium, and alone in the Cevennes, Stevenson wrote the two vivid little books, *An Inland Voyage* and *Travels with a Donkey in the Cevennes*. He also contributed to *The Academy* and *Vanity Fair*. To the weekly review, *London*, edited first by Robert Glasgow Brown and then by W. E. Henley, Stevenson contributed *The New Arabian Nights*, a brilliant fantasy. At this time, too, were published *A Lodging for the Night*, *The Sire*

de Malétroit's Door, and *Providence and the Guitar*; and Stevenson collaborated with W. E. Henley in the play *Deacon Brodie*. Before 1879 he had published *Will o' the Mill*, a delicate and a beautiful fantasy, as fine a thing as he ever did in his life.

In 1879, Stevenson, brilliant artist as he was, had not become known to the great public, so that he earned little enough by his pen. It was at this moment that a disagreement with his father left him dependent for his living upon his own exertions.

Travels in America

And here begins the second phase of his life, during which he travelled much, mingled with all sorts and conditions of men, and learned the ways of the world. Stevenson travelled to California, living at Monterey and at San Francisco, and fell very ill. Nevertheless, he wrote *The Pavilion on the Links*, drafted *Prince Otto*, and began *The Amateur Emigrant*. In 1880 he married an American, Mrs. Osbourne, née Van de Grift, and with her and her son, Samuel Lloyd Osbourne, lived at Juan Silverado, above Calistoga. The chronicle of his life here is contained in *The Silverado Squatters*. In the same year, the family difference having been composed, the Stevensons returned to Scotland, and thence went for a time to Davos, where they became acquainted with John Addington Symonds. In 1881 they were established at Pitlochry and Braemar. Stevenson wrote *Thrawn Janet* and *The Merry Men*, and during this year and the next, 1882, wrote *Treasure Island*, which made his reputation with the great public.

In 1883, while staying near Marseilles and near Hyères, he wrote *The Treasure of Franchard*, and *The Black Arrow*. To the years 1884-86 belong the delicate and beautiful *A Child's Garden of Verses*, the plays *Beau Austin*, *Admiral Guinea*, and *Robert Macaire*, written in collaboration with W. E. Henley, the second series (in collaboration with his wife) of *The New Arabian Nights*, the biography of Professor Fleeming Jenkin, and various short stories and beginnings. Then, in *The Strange Case of Dr. Jekyll and Mr. Hyde*, he achieved his second popular success. In the same year, 1886, he published *Kidnapped*.

On his father's death in May, 1887, he quitted England, never to return. With his wife, mother, and stepson he went to America. There he wrote *Ticonderoga*, contributed to *Scribner's Magazine* the essays afterwards published under the title of *Pulvis et Umbra*, wrote, with S. Lloyd Osbourne, *The Wrong Box*, a farce, and began *The Master of Ballantrae*. In 1888 the Stevensons sailed for a cruise among the Pacific Islands, in the schooner yacht *Casco*. The expedition was arranged by S. S. McClure, the American publisher, who commissioned Stevenson to write of the Islands; a task to which, strange to say, Stevenson found himself antipathetic.

During the voyage he began, in collaboration with his stepson, *The Wrecker*, a fine, spirited, humorous story. Stevenson stayed at Honolulu for about six months, and visited the leper settlement at Molokai. Thence the family sailed in the *Equator*, a trading schooner, for another six months' cruise. At Christmas, 1889, they came to Samoa, where, at Apia, Stevenson bought an estate, which he named Vailima, and settled there. Here he wrote *The Bottle Imp*. During a trip to Sydney and back, he wrote the letters for which McClure had commissioned him. Of his life at Vailima Stevenson told in the *Vailima Letters*, addressed to Sir Sidney Colvin, and published in the Edinburgh Edition of his works. At Vailima he wrote the *Footnote to History*, *Catriona*, and in collaboration with S. Lloyd Osbourne, *The Ebb-Tide*, a story of the South Seas, which in some respects is the most brilliant of his works. In 1893, during a severe attack of illness, he dictated *St. Ives*, afterwards completed by Sir Arthur Quiller-Couch.

Death at Vailima

Towards the end of 1894 he was at work on the beginning of *Weir of Hermiston*, which remains a noble fragment. On Dec. 3, while talking with his wife, he suddenly lost consciousness. A blood-vessel in his brain had broken, and he died in two hours. He was buried upon the summit of Mount Vaea.

Stevenson was a great artist. His mastery of the art of words was consummate. He owned an admirable sense of beauty, a singularly acute perception of character, a vivid faculty of humour. As an essayist, he was the maker of some among the most charming pieces in the English language. As a writer of romance, he was the greatest of his day. Whatever he touched, he touched to perfection of form. Stevenson should rather,



1. Etching by W. Strang. 2. Photograph taken at Boston in the '80s. 3. Oil sketch by Sir W. B. Richmond, about 1885-86 (N.P.G., London). 4. Photo in the possession of Edmund Gosse. 5. Pencil drawing at Sydney, 1893, by

Percy F. S. Spencer (N.P.G.). 6. Photo taken in Samoa (by permission of Methuen & Co). 7. Photo by H. Walter Barnett, 1893. 8. Mrs R. L. Stevenson (Photo, Mendelssohn). 9. Home at Vailima. 10. Grave on Mt. Vaea, Samoa.

ROBERT LOUIS STEVENSON: PORTRAITS AND SCENES IN THE NOVELIST'S LIFE

perhaps, be regarded as the late, bright flower of the old Scots tradition of life and letters, than as a great creative maker. It is as the artist in letters that Stevenson remains, and will remain, one of the exemplars in English literature.

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Osbourne, 1903; In the Track of Stevenson, J. A. Hammerton, 1907; R. L. Stevenson at Davos, W. G. Lockett, 1934; R. L. S., S. Gwynn, 1939; Intro. to Novels and Stories of R. L. S., V. S. Pritchett, 1945; R. L. S. (British Novels), L. Cooper, 1947; No Son of Mine (fiction), G. B. Stern, 1948; R. L. S., D. Daiches, 1948.

Stevenson, THOMAS (1818-87). Scottish engineer. Born in Edinburgh, July 22, 1818, he was the son of Robert Stevenson.



Thomas Stevenson, Scottish engineer

Educated at the high school, Edinburgh, he showed a strong bent for mathematics and was soon contributing articles to scientific journals on meteorology, etc. He joined his father in business as a lighthouse engineer, and with his brother David was responsible for the erection of several lighthouses. Making a study of lighthouse lanterns, he invented the valuable azimuthal condensing system. His principal contribution to meteorology was the development of the louvered thermometer screen which bears his name and is widely used in modified form. He died May 8, 1887. His son, R. L. Stevenson (*q.v.*), sketches his character delightfully in *Memories and Portraits*.

Stevenston. Town of Ayrshire, Scotland. It stands near the Firth of Clyde, 28 m. S.W. of Glasgow, with a rly. station. Here Nobels established a factory for making explosives. The coal mines of the vicinity are disused. Pop. approx. 12,000.

Stevinus, SIMON (1548-1620). Dutch mathematician. He was born at Bruges, but little is known of his life. He was one of the first mathematicians to deal with the properties of regular and semi-regular polyhedra, and he laid down certain of the fundamental principles of mechanics, which show that he must have been one of the leading mathematicians of his time. In 1586 he published his famous pamphlet on decimals. The place and exact date of his death are unknown. He is commemorated in Bruges by a statue in the Place Simon Stevin.

Steward (A.S. *stigo*, *sty*; *ward*, keeper). One who manages an estate. It is also used for attendants on ships and for officials at race meetings. In some churches, *e.g.* the Methodist, certain officials are known as stewards. In England the lord high steward is one of the great officers of state, and there is also a lord steward in the royal household. The surname Stewart arose from the fact that King David I of Scotland gave to a certain Walter the office of steward of Scotland. Great steward of

Scotland is one of the titles of a prince of Wales. See Bailiff; Jockey Club; Royal Household; Shop Steward; Stewart.

Stewards' Cup. English horse race. A sprint handicap for three-year-olds and upwards, it was instituted in 1840, and is run over a 6-furlong course at Goodwood (*q.v.*) on the first day of the annual meeting in July.

Stewart. Island belonging to New Zealand and separated from S. Island by Foveaux Strait. It is very mountainous, rising to 3,200 ft., is forest-clad, and is a tourist resort. Its area is 662 sq. m.

Stewart, STUART, OR STEWART. Name of a Scottish family. Scion of an ancient Breton family settled in England late in the 11th century, the first to settle in Scotland was Walter, whom David I created seneschal or steward of Scotland, granting him land in Renfrewshire. The stewardship passed in succession to James Stewart (d. 1309). From his brother John's seven sons were descended several noble Scottish families. Walter (d. 1326), 6th steward, son of James, fought at Bannockburn, and married Marjory, daughter of the Bruce. His son Robert became king of Scotland in 1371. From him descended the royal line in male succession to James V (d. 1542).

Through James's daughter, Mary Queen of Scots, the succession to the crown continued in James VI, who came to the English throne in 1603, and whose direct descendants held the crown until the death of his great-granddaughter Anne, 1714. By the Act of Settlement the succession then devolved on the house of Hanover, and the male representative of the royal house of Stuart and claimants to the throne ended in Henry, Cardinal York. See Charles Edward; James I; James Edward; Royal Family.

Stewart, ALAN BRECK. Character in R. L. Stevenson's *Kidnapped*. A Highland Jacobite, he appears early in the story, plays an active part in the hero's adventures, and reappears in the sequel, *Catriona*.



Balfour Stewart, Scottish physicist

Stewart, BALFOUR (1828-87). Scottish physicist and meteorologist. Born in Edinburgh, Nov. 1, 1828, he was educated at St. Andrews and Edinburgh

universities. In 1856 he became an observer at the Kew Observatory. In 1868 he was awarded the Rumford medal of the Royal Society for his work on radiant heat, on which he was a leading authority. Stewart became director of the Kew Observatory in 1859, and suggested the connexion between sunspots and magnetic disturbances on the earth. In 1870 he became professor of natural philosophy at Owens College, Manchester. Stewart wrote many text-books, including *Treatise on Heat*, 1866, *Elementary Physics*, 1870, *Conservation of Energy*, 1875, *Practical Physics*, 1885-87. With Professor P. G. Tait he published anonymously *The Unseen Universe*, 1875, dealing with the soul and a transcendental universe. The two authors revealed their identities a year later, and a sequel followed in 1878. Stewart died Dec. 19, 1887.

Stewart, DUGALD (1753-1828). Scottish philosopher. Born Nov. 22, 1753, he was educated at the



Dugald Stewart, Scottish philosopher

high school and university of Edinburgh, in which he became professor of mathematics in 1775, proceeding to the chair of moral philosophy in 1785. He died in Edinburgh June 11, 1828. Stewart was one of the chief representatives of the Scottish school, an upholder of the doctrine of "common sense" as the fundamental law of human belief. The existence of the Ego is suggested by the understanding; the existence of the objects of the external world is shown by the repeated perception of the same thing and the fixed and coherent order of nature.

Stewart, HENRY BENEDICT (1725-1807). Jacobite prince and cardinal. Younger son of James Edward, the Old Pretender, he was born in Rome, March 6, 1725. His father made him duke of York, and his life was passed mainly in Rome, although in 1745 he was with some French troops intended for the invasion of England. In 1747 he took orders, being at once made a cardinal, and as Cardinal York he is frequently known. A number of ecclesiastical appointments were given to him, including the bishopric of Frascati.

In 1788 he became, by the death of Charles Edward, king of Great

Britain according to legitimist ideas, and his supporters called him Henry IX. When the French invaded Italy in 1798 he was forced to leave Rome and lost his income; George III, however, made him an allowance of £4,000 a year. In 1800 he returned to Rome, where he lived until his death, July 13, 1807. He is buried in S. Peter's. Henry was the last male of the royal house of Stewart. *See* Jacobites; Stewart; *consult also* The Last of the Royal Stuarts, H. M. Vaughan, 1906; H. S., Cardinal of York, and his Times, A. Shield, 1908.

Stewarton. Market town and police burgh of Ayrshire, Scotland. It stands on Annick Water, 5 m. N. of Kilmarnock, and has a rly. station. In the town are manufactures of textiles, engineering works, and dyeworks. An agricultural district surrounds it. The name is due to a supposed connexion with the royal family of Stewart. Pop. 2,749.

Stewartry. In Scotland, former name of a district administered by a steward, a royal official having both criminal and civil jurisdiction. The term is now applied only to the stewardry of Kirkcudbright (*q.v.*).

Steyn, MARTINUS THEUNIS (1857-1916). South African statesman. Born in the Orange Free



State, Oct. 2, 1857, he was educated in Holland and England, being called to the bar at the Inner Temple in 1882. On his return to S. Africa he practised

law at Bloemfontein, becoming

state attorney in 1889, and five years later first puisne judge. President of the O.F.S. in 1896, he maintained friendship with Great Britain until 1899, when he followed the Transvaal in declaring war. On the advance of the British to Bloemfontein, Steyn took to guerrilla warfare, but was a party in the peace negotiations of 1902. Soon after the surrender at Pretoria he went to Europe. On returning to S. Africa he became a staunch supporter of the British govt. He died Nov. 28, 1916.

Steyne, MARQUIS OF. Character in Thackeray's *Vanity Fair*, suggested by either the 2nd or the 3rd marquis of Hertford. He is the wicked old nobleman whom Becky Sharp fascinates for sordid



Marquis of Steyne

From a drawing by W. M. Thackeray

S. Andrew's church, with some notable Norman work, and the grammar school, founded in 1614. Steyning was a Roman settlement and, being then on the coast, became a scaport, until the sea receded in the 14th century. It had also a famous shrine and a Benedictine religious house. From 1298 to 1832 it sent two members to parliament. The neighbouring Bramber Castle was purchased by the National Trust in 1945. Pop. 2,500. *Pron.* Stenning.

Steyr or **STEIER.** Town of Upper Austria. It stands at an alt. of over 1,000 ft. at the confluence of the Steyr and the Enns, being 85 m. W. by S. of Vienna. There are steel and iron mines, and manufactures include cutlery, paper, woollens, motor-cars, cycles, and rifles. Steyr was formerly the seat of the margraves of Styria. Morcau signed an armistice with the Austrians here, Dec. 25, 1800, after Hohenlinden. Pop. 29,110.

Stibnite or **ANTIMONITE.** A trisulphide of antimony. Grey in colour with a metallic lustre, it is found in quartz veins associated with granites, these veins often containing gold; also as replacement deposits in limestones and shale, usually with galena. Stibnite is the most important ore of antimony (*q.v.*).

Sticking (or Sticky) Bomb. An anti-tank hand-grenade that adheres to its target. Two types

were used by British infantry in the Second Great War: the self-igniting incendiary grenade, and the No. 74 anti-tank grenade. The self-igniting grenade was a short-necked half-pint glass bottle, 90

reasons, and whois thrashed by Becky's husband, Rawdon Crawley. *Pron.* Steen.

Steyning. Town of Sussex, England. It stands near the Adur, at the foot of the South Downs, 12 m. N.W. of Brighton, to which there is a rly. service. The chief

buildings are S. Andrew's church, with some notable Norman work, and the grammar school, founded in 1614. Steyning was a Roman settlement and, being then on the coast, became a scaport, until the sea receded in the 14th century. It had also a famous shrine and a Benedictine religious house. From 1298 to 1832 it sent two members to parliament. The neighbouring Bramber Castle was purchased by the National Trust in 1945. Pop. 2,500. *Pron.* Stenning.

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p.c. filled with a mixture of yellow phosphorus, benzene, water, and a strip of crude rubber. The remaining space contained air. When thrown against a target, the glass broke and the oxidation of the phosphorus in the air spontaneously ignited the benzene. The rubber, which had dissolved in the mixture during storage, made the incendiary materials tacky, so that they adhered to the target.

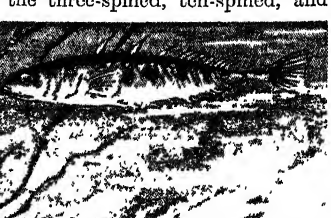
The No. 74 anti-tank grenade was introduced into the British army in 1939, and was a spherical glass or plastic container, which held 20 oz. of nitro-glycerine jelly, and which was covered with a woollen jacket steeped in a powerful adhesive. Attached to the top was a wooden handle incorporating a lever in contact with a firing pin. When the safety pin was withdrawn and the grenade thrown, the firing pin, which detonated a 5 sec. fuse, was released. Upon striking a target, the grenade stuck to it, the container broke, and the explosive was ignited. The No. 74 anti-tank grenade was effective only against one-inch armour. *See* Grenade.

Stick Insect (*Phasmidae*). Family of orthopterous (straight-winged) insects. In them the body

closely resembles a twig, and is extremely difficult to detect when at rest among foliage. These insects, of which about 600 species are known, are common in

the tropics, where they attain a length of over 13 ins. Four or five species occur in Europe. In some species the male insect is a rarity; many generations may fail to produce one. *See* Insects; Protective Colouring colour plate.

Stickleback (*Gasterosteus*). A group of small fishes, which gain their popular name from the spines on the back. Three species occur in Great Britain, and are known as the three-spined, ten-spined, and



Stickleback. Three-spined species on guard over the nest which it has built among the weeds

fifteen-spined, the first two being fresh-water species, the third marine. Of these the first is most common. In the breeding season the male becomes resplendent with blue and red, and builds a nest in which the female deposits her eggs. The marine stickleback is about 6 ins. long. It builds a pear-shaped nest of seaweed, and has been known to keep close watch over it for three weeks.

Sticta. Genus of lichens of the family Parmeliaceae. Mainly tropical in distribution, it is leaf-like in growth, and of a leathery texture. Dyes are obtained from many species.

Stiff Neck, WRY NECK, OR TORTICOLLIS. Affection of the muscles of the neck which leads the patient to turn his head to one side, and to rotate the whole body instead of turning the head to look at an object. Several forms are recognized. The so-called rheumatic variety is due to inflammatory changes in the fibrous tissue or fascia surrounding the muscles. Chronic torticollis may be congenital, or due to cicatricial changes in the sterno-mastoid muscle which lead to its shortening. Spasmodic torticollis is a form in which the head is continually jerked or twisted to one side. It is probably due to irritation of the nerves supplying the muscles. The acute rheumatic form should be treated locally by massage and physiotherapy. Chronic torticollis generally demands a surgical operation directed towards lengthening the shortened muscle. Electrotherapy as well as local treatment of the nerves is useful in the spasmodic form.

Stigand (d. 1072). English prelate. A priest at Assundun, he became chaplain to Canute, and was a leading supporter of his widow, Emma. In 1043 he was made bishop of Elmham, in 1047 of Winchester, and in 1052 archbishop of Canterbury in place of the outlawed Robert of Jumièges. Robert, however, had not given up the see, and the pope ordered him to be restored, thereby impairing Stigand's position, though not securing his removal. Stigand did not crown William the Conqueror, nor did he consecrate many bishops; but William kept him in office until 1070, when the papal legates brought against him charges of usurpation and plurality. Stigand was put in prison and there remained until his death, which probably occurred on Feb. 22, 1072.

Stiggins. Character in Dickens's novel *The Pickwick Papers*, a par-

son in some nondescript dissenting sect, and described as a "deputy shepherd." He is represented as a canting hypocrite addicted to drink. Tony Weller's wife puts herself under his ministrations, but after her death Tony joyously ducks him in a horse-trough.

Stigma. In flowering plants, the summit of the ovary or of the style, which, if present, is a prolongation of the ovary. It is specially adapted to retain the pollen-grains which are brought to it by insects, the wind, or in self-fertilised species by the action of the stamens. This receptive portion is known as the stigma. It is generally rough, owing to a coating of short hairs or nipple-like points, which secrete a sticky liquid that holds the pollen-grains, and apparently excites them to send out the shoot-like tubes through which the male nucleus is conveyed to the ovules in the ovary. *See Flower.*

Stigmata (Gr., punctures, marks). Name for the five wounds of Our Lord, in the hands, feet, and side; also for similar marks borne by other persons. Between three and four hundred cases are on record, some of them fully attested by free-thinking physicians, of the appearance of the stigmata after prolonged meditation on the passion of Christ. One of the earliest recorded cases is that of S. Francis of Assisi. Stigmatisation is probably due to auto-suggestion, since bleeding through the skin, blisters, scars, and marks of prearranged form have been made to appear and disappear by hypnotic suggestion.

Stilbite. In mineralogy, one of the zeolite group. A hydrated silicate of calcium and aluminium, white to red in colour with a pearly lustre, it occurs in basaltic rocks and elsewhere. *See Zeolite.*

Stilboestrol. Synthetic oestrogen sex-hormone, used medicinally in a manner similar to the naturally occurring substance. A derivative of the unsaturated aromatic hydrocarbon, stilbene, it occurs as a white crystalline substance. It has given valuable results in the treatment of prostatic carcinoma in the male.

Stiletto (Ital., dim. of *stilo*, dagger). Slender, round-bladed dagger, about 6 ins. long. *See Dagger.*

Stilicho, FLAVIUS (c. 359-408). Roman soldier and statesman. A Vandal by birth, he became a notable commander and diplomatist under the emperor Theodosius I, on whose death in 395 he virtually

ruled the Western empire. Appointed guardian of the young Honorius, in 398 he became his father-in-law. Stilicho's relations with the barbarians are obscure, and probably to suit his convenience he was quite willing to intrigue with one at least of their leaders, Alaric, king of the Visigoths, though he defeated him at Pollentia in 403. He overthrew the great invading army of Rada gaisus at Faesulae (Fiesole) in 405. He had made many enemies, and as a result of their intrigues with Honorius he was murdered, Aug. 23, 408. Stilicho was the patron of the poet Claudian. *Pron. Stillyko.*

Still. Apparatus used in the distillation of alcohol. There are two chief kinds, the pot still (*q.v.*) and the patent still. *See Alcohol.*

Still-birth. Birth of a dead foetus. It is most often the result of an accident to the mother or of disease of mother or foetus. Syphilis can cause it in the human species; or the umbilical cord may strangle the infant before or during birth. *See Birth; Pregnancy.*

Still Engine. Combined internal combustion and steam engine invented by W. J. Still. The upper part of the piston acts as an oil engine, while the lower part acts as a steam engine with steam generated from the combined heat of jacket water and exhaust gases. The process of steam generation is assisted by arranging that the exhaust gases shall give up their heat to the water in a regenerator. The heat remaining in the gases after leaving the regenerator heats the water condensed from the exhaust steam leaving the cylinder, this water being used as the feed water and passed back into the jackets. Some of the heat of combustion passes through the piston and superheats the steam on the lower side, thus still further improving the economy. As only about 15 p.c. of the heat in the steam can be converted into useful work, in practice the increase in b.h.p. does not exceed 12 p.c. An auxiliary oil-burner is fitted to the boiler for use when starting up or when extra power is required. Scott-Still marine engines of 2,500 b.h.p. have been fitted to motor ships and operated satisfactorily over long periods. *See Internal Combustion Engine; Steam Engine.*

Stillingfleet, EDWARD (1635-99). An English divine. He was born at Cranborne, Dorset, April 17, 1635, and was educated at S.

John's College, Cambridge. Having been ordained, he was successively rector of Sutton, Beds, of S. Andrew's, Holborn, and canon of S. Paul's. In 1678 he was chosen dean of S. Paul's, and in 1689 bishop of Worcester. He died March 26, 1699. Stillingfleet's great learning was employed in defending his church against nonconformist and R.C. claims.



Edward Stillingfleet, English divine

A man of liberal outlook, he was one of the most noted preachers of his time. His chief writings are *Irenicum*; *Origines Sacrae*; and *A Rational Account of the Grounds of the Protestant Religion*.

Still Life. In art, the term for that class of subjects for a painting which is confined to inanimate objects in nature, such as flowers, fruit, vegetables, dead poultry or game, often grouped with appropriate manufactured articles, e.g. vases or kitchen utensils. Certain Dutch artists of the 17th century excelled in still-life painting, but it was raised to the level of high art by the French painter, J. B. S. Chardin (q.v.), who gave as much thought to the grouping of his humble subjects (fruit, bread, glasses of wine, etc.) and used them as much as a means of expressing his own poetic, impressionistic vision as Velazquez in the realm of human portraiture or Turner in that of noble landscape. But to most painters still life painting is a useful exercise rather than an end in itself.

Stilt (*Himantopus*). Wading bird of the sandpiper group, so called on account of its very long legs. There are several species, of which the black-winged stilt (*H. himantopus*) occurs as a migratory bird in Europe and is very occasionally found in Great Britain.

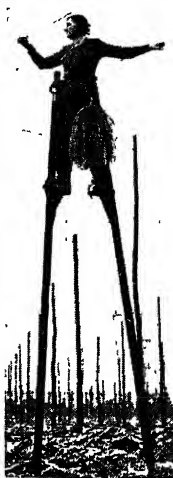
Stilt. Word used in several senses. In ceramic art, it is a piece of iron or hard-fired clay for keeping articles apart in the kiln. In civil engineering, it is any of the piles comprising the back of the sheet piling for a starling. The leg of a wheelbarrow, plough handle, shaft, and also a crutch are known as stilts. The word also means one of a pair of wooden poles formed with a foot rest for enabling persons to walk above ground level.

Stilton Cheese. A British veined cheese, which derives its

name from a village in Huntingdonshire on the Great North Road, whither it was brought by makers for transport by coach to London. The fame of Stilton cheese is international and is of great age in England, where already in 1736 the contemporary product was said "not to have the true Relish that the first famous Stilton Cheeses had." It was first publicly sold at the Bell Inn, Stilton, in the 18th century. The neighbouring counties of Leicester and Rutland share with Hunts in making the cheese, which is a seasonal product, depending on the richest milk supply, with occasional supplement of extra cream. It is not pressed, and is the best example of the semihard, slow-maturing, blue cheeses. The veining is produced by the penicillium mould. Good Stilton has been made in New Zealand, but with mould imported from England. The colour is white, with a crinkled but not cracked brownish rind. Gastronomes no longer support the popular theory that a good Stilton cheese is bettered by the addition of port wine.

Stilus (Lat.). Writing implement used in classical times. See under *Style*.

Stilwell, JOSEPH W. (1883-1946). American soldier. Born in Florida, he joined the army in youth, and served for two years in the Philippines before being recalled to West Point as an instructor. In 1910 he returned to the Far East, where he became an expert in Chinese language and military methods. In the First Great War he won the D.S.M. in France. Stilwell contributed much to the raising and training of the U.S. army, and the attack on Pearl Harbour led to an



Stilt. A woman stilt-walker in the hop fields at Paddock Wood, Kent

appointment as his country's military representative in China and to his selection by Chiang Kai-shek as chief of staff and commander of the Chinese armies in Burma. In early 1942 he led the heroic retreat of a remnant of his forces through the jungle and over mountains to India; and in Dec. of the same year he set out at the head of a retrained and strengthened force to build the Ledo Road (q.v.) through N. Burma to China. To his troops "Vinegar Joe," he died in San Francisco, Oct. 12, 1946, of a liver complaint contracted during the jungle retreat. Extracts from his diaries and letters were published in 1948, as *The Stilwell Papers*.

Stimson, HENRY LOUIS (b. 1867). American lawyer and politician. Born in New York, Sept. 21, 1867, he graduated at Yale in 1888 and was admitted to the bar in 1891 after studying at Harvard. As district attorney in New York, 1906-09, he successfully prosecuted the sugar trust and other powerful business concerns. Secretary of war, 1911-13, he greatly increased the efficiency of the American army. He served in France during the First Great War. Later he became special envoy to Nicaragua, 1927; governor-general of the Philippines, 1928-29; secretary of state, 1929-33, and judge of the permanent court of international justice at the Hague, 1935. He was again secretary of war during 1940-45. His policy of notifying Japan, in 1932, that the U.S. would not recognize any situation brought about by violations of the Kellogg Pact was sometimes called the Stimson doctrine. A book of memoirs appeared 1947.



Henry Stimson, American politician

Stimulant. Generally, a drug which increases the activity of an organ, e.g. gentian, which stimulates the flow of gastric juices, and strychnine, which stimulates the action of the heart. Beverages containing alcohol are called stimulants. See *Drug*.

Stinchar. River of Ayrshire, Scotland. It rises in Carrick and flows 30 m. generally S.W. past Barr to the Firth of Clyde at Ballintrae.

Sting. In insects, an adaptation of the egg-conduit (ovipositor) to serve as a weapon of defence or for incapacitating their prey. The



Joseph Stilwell, American soldier

piercing organ is connected with glands, from which a minute quantity of acid or alkaline poison flows into the puncture. These organs reach their highest development and complexity in the aculeate Hymenoptera—bees, wasps, ants, and gall-wasps. In the sand-wasps and some others that provision their cells with stung caterpillars or other insects, the effect of the poison is to paralyse the nerve-centres without

Sting. Enlarged needle of a bee's sting. *a*, barbed point; *b*, piston; *c*, base

causing death and decomposition. In the social wasps and bees the sting is used for defensive purposes or for the elimination of redundant members of the community. The sting consists of a gouge-like director, in whose concave face run two needles which push the poison before them in the director. In the scorpions the sting is a hardened and hooked point at the last segment of the narrowed hind body within which are the poison glands. The sting of the nettle consists of a hollow hair, through which poison flows when the tip is broken off.

The so-called stinging of mosquitoes, fleas, and other flies is effected by the modified mouth parts. Where fish are credited with stinging the puncture is made by a cleverly manipulated spine, and the consequent irritation or inflammation results from the introduction of slime from the skin of the fish. See Hair; Scorpion; Sting Ray.

Sting Ray. Popular name for a family of fishes (Trygonidae), in which a serrated spine is present on the whip-like tail. About 25 species of true sting rays (*Trygon*) are known, mainly restricted to the warmer seas, one species being found around the S. shores of England. Although the spine is not

connected with a poison gland, it can wound.

Stinkhorn (*Phallus impudicus*). Fungus of the family Phallaceae. The mycelium runs like a thick, white cord through leaf-mould, and bears at intervals knobs which ultimately become the size and shape of a fowl's egg. Then the top splits, and from it rapidly arises a white, spongy column, 7-8 ins. high, with a conical cap divided into open cells, which are filled with an olive-green slime containing the spores. This slime, which



Stinkhorn in its stages of development. About 1-5th natural size

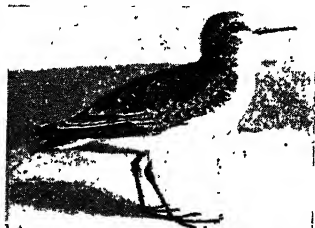
attracts flies, is the principal source of the atrocious odour which gives the plant its name.

Stinkwood (*Foetidia mauritiana*). Evergreen tree of the family Lecythidaceae. It is a native of Mauritius and Madagascar. It attains a height of 30 ft., and has a tough, bitter, and astringent bark. The alternate leaves are oval, and the solitary flowers are without petals; they are succeeded by four-sided nuts. The wood has an unpleasant smell.

Stinnes, Hugo (1870-1924). German financier. Born Feb. 12, 1870, he inherited a large fortune from his father in 1897. During the First Great War he was the chief contractor for war material. After the downfall of the empire, he became a financial magnate. He bought up many newspapers, organized shipping companies,

took over engineering and mining works. His group controlled the greater part of Germany's coal, iron, and steel supply, the greatest of his concerns being the Rhine-Elbe Union. Regarded as the most powerful man in Germany, in 1921 he endeavoured to

mitigate the terms imposed upon Germany. He died April 10, 1924. The combine fell into difficulties, but his two sons reconstructed it with U.S. assistance, and under Hitler it became a main pillar of the revived German engineering and armament industry.



Stint. *Calidris minuta*, the shore bird which frequents the British coast

Stint. Genus of shore birds (*Calidris*). Three kinds of stint occur in the U.K. The little stint (*C. minuta*), no larger than a sparrow, has mottled brown and black plumage with white under parts. It is found about the E. coasts in spring and autumn, and nests in the N. of Norway. The American stint (*C. minutilla*) and Temminck's stint (*C. temminckii*) are occasional visitors to Great Britain.

Stint. An allotted portion, or an amount of work to be done within a given time. A dialect word used mainly in the N. of the U.K., it is applied in one sense to the width of coal-face each miner is expected to work; in 1947, 70,000 Yorkshire miners ceased work through a dispute at Grimethorpe colliery caused by an extension in the length of the agreed stint.

Stipend (Lat. *stipendium*, from *stips*, a small coin; *pendere*, to weigh out). Payment made periodically for services rendered. In early times it meant the payment given to soldiers; today it is the salary paid at stated intervals to a curate or other clergyman, and specifically the income from a benefice, and also that paid to a professor or judge. In Scotland it applies especially to the provision for a minister of the Established Church by free teinds (or tithes), being either money payment or payment in kind at the value of the annual rate. From this it has come to mean the salary of a minister of any church. In the R.C. Church a stipend is the fee a priest may demand for saying a special mass.

Stipendiary. Literally, one who receives a stipend. It is applied usually to the paid magistrates,



Sting Ray. The Fire Flare, occasionally found round British coasts, showing the serrated spine on its tail

who are appointed in London and certain English cities and boroughs, where the work is too heavy or intricate for the ordinary unpaid justices of the peace. Stipendiaries, who have the power of two ordinary justices, are appointed by the crown and in England and Wales must be barristers or solicitors (in London barristers only) of 7 years' standing. *See* Justice of the Peace; Magistrate.

Stipple (Dutch *stippel*, little point). Term in engraving, etching, and drawing, to denote the process of dotting or making small, short marks with a point, in order to produce detail or a local effect of light and shade. Stipple-engraving was invented in the 18th century, and, before lithography came into use, was employed as the best method of reproducing chalk drawings. Bartolozzi was its most famous exponent in England. In interior decorating the term stippling is applied to a style of painting with a rough finish.

Stipule (Lat. *stipula*, straw, stubble). Leaf-like outgrowths at the base of the leaf-stalk of some plants. There is usually a pair, and these may stand out free of the petiole, as in willow and garden geranium, or be united to it (adnate) by the greater part of their length, as in rose. In the bud they are larger than the leaf proper, which they enfold and protect during its early development. In many cases they fall off or wither soon after the leaf has expanded. *See* Leaf; Plant.

Stirling. British heavy bomber aeroplane, a product of Short Bros., Ltd. Designed before the Second Great War, the Stirling was the first four-engined bomber to reach squadron service in the R.A.F. and made its first bombing raid in Feb., 1941. With a wing span of 99 ft. 1 in., and a length of 87 ft. 3 ins., it carried a maximum bomb load of 18,000 lb., and a crew of 7, including three gunners in power-operated turrets. The standard power-plant consisted of four 1,650 h.p. Bristol Hercules radials. The Stirling was later adapted as a military transport and glider tug. *See* Aeroplane illus., p. 129.

Stirling. Royal and mun. burgh and co. town of Stirlingshire, Scotland. It stands on the Forth, 29 m. N.E. of Glasgow and 35 m. N.W. of Edinburgh, and is served by British rlys. The castle, formerly a residence of the Scottish kings, is prominent on a hill. In the precincts are parlia-

ment house, chapel royal, and palace. The castle is public property, being one of the for-



Stirling. The fortified castle, connected with most of the Scottish kings, from King's Knot

tresses maintained under the Act of Union. Other buildings include the large church of the Holy Rood, trades hall, and Cowane's Hospital, now used as the guildhall. Other features are the "auld brig" across the Forth, the statue of Bruce, and Argyre's lodging. The burgh and county buildings, infirmary, Smith Institute, and high school are modern. A rly. junction, Stirling has manufactures of leather, tartans, tweeds, agricultural implements and glass. It elects an M.P. with Falkirk and Grangemouth.

Stirling owes its importance to its position as the key to the Highlands. It was made a royal burgh about 1100, and until 1603 was in many ways the capital of the country. Near are Cambuskenneth Abbey, the burial place of James III, and Abbey Craig, crowned by the Wallace monument with a Valhalla, or hall of fame. Market day, Thurs. Pop. 28,500.

Stirling, WILLIAM ALEXANDER, EARL OF (c. 1567–1640). Scottish poet and statesman. Born at the



Earl of Stirling, Scottish poet

manor house of Menstrie, near Stirling, he studied at Glasgow and Leyden. Later he became tutor, first to Archibald, 7th earl of Argyll, and afterwards to the young king James, whom he accompanied into England in 1603. In 1621 he was rewarded with the grant of Nova Scotia and a vast hinterland, and in 1631 he received the monopoly of printing the new version of the Psalms. From 1626 onwards he was secretary of state for Scotland, and on the occasion of

the coronation of Charles I, at Holyrood Palace, was created earl of Stirling. His last years were clouded by financial trouble, he died Feb. 12, 1640. His poems include several rather laboured tragedies, Darius, 1603; Julius Caesar, 1607; some graceful sonnets, and the immense Domesday, 1614. The third part of Sidney's Arcadia (*q.v.*) in the edition of 1621 was added by him. *Consult* Memorials of the Earl of Stirling, C. Rogers, 1877.

Stirling, JAMES HUTCHISON (1820–1909).

Scottish philosophical writer. Born June 22, 1820, he was educated at Glasgow university, and for some time practised as a physician. His Secret of Hegel and Textbook to Kant are two of the most important contributions to an understanding of these writers. He also published an excellent translation of Schwegler's History of Philosophy. He died March 19, 1909. *Consult* Life, A. H. Stirling, 1912.

Stirling, MARY ANNE (1815–95). British actress, usually known as Mrs. Fanny Stirling. Born in



Fanny Stirling, British actress

London, she made her first stage appearance in 1827 under the name of Fanny Clifton. After touring the provinces with her husband, Edward Stirling, she appeared at the Adelphi

Theatre, London, in 1836 and later joined Macready at Drury Lane. In 1852 she made her greatest hit as Peg Woffington in Masks and Faces. Later she was unexcelled in such parts as Mrs. Malaprop and the Nurse in Romeo and Juliet. From 1870 she taught reciting and elocution at the Royal Academy of Music and retired from the stage in 1885. In 1894 she married Sir C. H. Gregory, but she died on Dec. 31 in the following year. *Consult* The Stage Life of Mrs. Stirling, P. Allen, 1922.

Stirling Bridge, BATTLE OF. Scottish victory over the English, Sept. 11, 1297. William Wallace had collected an army from the coast districts N. of the Tay, and awaited the English in the Stirling valley. Warrenne, earl of Surrey, with some 50,000 men, advanced to the bridge near Stirling, the only one by which the Forth could be

crossed, and that barely wide enough for two horsemen to ride abreast. Wallace, who occupied a commanding position near by, waited until half the English army was across, when he swept down and cut them to pieces, forcing those who had not yet crossed to beat a hasty retreat. See Wallace.

Stirlingshire. Midland county of Scotland. With an area of 451 sq. m., it is partly mountainous. In



Stirlingshire arms

the N.W. are outliers of the Grampians, Ben Lomond rising to 3,192 ft. In the centre are the Gargunock Hills, Campsie Fells, Fintry Hills, and Kilsyth Hills. In the E. the county is undulating and contains the carse of Falkirk and Stirling, where the soil is remarkably fertile. The chief rivers are the Forth, with its tributaries Avon and Carron, the Kelvin, and the Endrick. In the shire are parts of Lochs Lomond



Stirlingshire. Map of the Scottish county famous for its battlefields

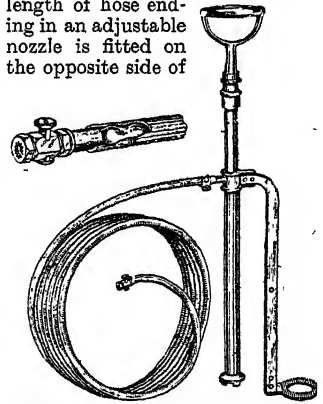
Roman occupation. Around Stirling and Falkirk numerous battles were fought. Pop. 185,900.

HISTORICAL ASSOCIATIONS. James II and James V were born at Stirling Castle, where the latter, Mary Queen of Scots, and James VI were crowned, and Alexander I died. There, too, James II stabbed the earl of Douglas, and Lennox was killed in 1571. James III was assassinated at Beaton's Mill, a few miles from Stirling, and he and his wife, Margaret of Denmark, are buried in Cambuskenneth Abbey. George Buchanan (q.v.) was born at Killearn. Consult History of Stirlingshire, W. Nimmo, 1880.

Stirrurp (A.S. *stiráp*, *stigráp*, from *stigan*, to climb; *ráp*, rope). Loop of metal with a horizontal portion for receiving the foot of a rider, and attached by a strap to the saddle. It is used to assist a horseman in mounting, and as a support while riding (q.v.).

Stirrurp Pump. Device for the manual projection of water in extinguishing fires. It consists of a thin metal cylinder within which

slides a plunger operated by a handle at the top. At a third of the distance down the outside of the cylinder projects an inverted L-shaped piece of metal terminating in a foot-rest or stirrup. A length of hose ending in an adjustable nozzle is fitted on the opposite side of

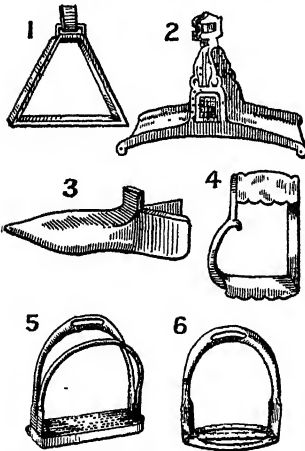


Stirrurp Pump. A stirrup hand-pump, with dual jet and spray nozzle

the stirrup-retaining collar. To operate the pump, the free end of the cylinder is immersed in a bucket or other receptacle for water and held steady by the weight of the operator's foot on the stirrup. The stirrup pump was designed shortly before the outbreak of the Second Great War for the specific purpose of extinguishing incendiary bombs.

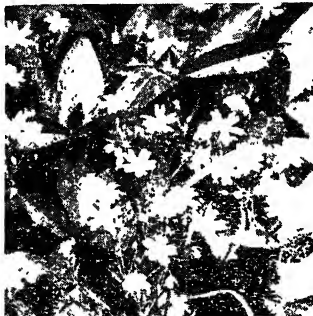
Stitch (A.S. *stician*, to prick). Sharp pain felt in the vicinity of the costal margin on either side of the body, usually after severe exertion. In one whose organs are sound it has no pathological significance, and passes off after rest.

Stitchwort (*Stellaria holostea*). Perennial herb of the family Caryophyllaceae, native of Europe



Stirrurp. 1. German, 12th century. 2. Arab, 15th century. 3. English soleret, or steel shoe, 15th century. 4. German, 17th century. 5. Safety stirrup used by the Young Pretender. 6. Modern pattern

and Katrine, and all Loch Arklet Agriculture is the staple industry, although the county has coal and ironstone mines. Wheat and oats are the principal crops; cattle and sheep are reared. The county is served by rly. and by the Forth and Clyde canal. Stirling is the county town; other towns are Falkirk, Grangemouth, Kilsyth, Denny, Bridge of Allan, and Bonnybridge. With Clackmannanshire the co. forms one bor. and two co. constituencies. There are many relics of



Stitchwort. Familiar wild flower growing among Dog's Mercury

and W. Asia. It has four-angled, brittle, jointed stems, which give off rigid, grass-like leaves in pairs from the joints. The pure white flowers are about three-quarters of an inch across, and the five petals are deeply cleft. One species (*S. media*) is the chickweed common in cultivated and waste places.

Stiver (Dutch *stuiver*). Obsolete Dutch silver coin, the 1-20th part of a guilder, value one penny. In the Dutch colonies it was minted in copper. The word was afterwards used of any small coin.

Stjernhielm, GEORG (1598-1672). Swedish poet and scholar. Born Aug. 7, 1598, he graduated at Greifswald, and after travelling throughout Europe became a teacher at Stockholm. He was in favour with Gustavus Adolphus and Christina, and held several appointments at Dorpat (Tartu), Trondhjem, and at Stockholm, where he died April 22, 1672. A noted etymologist, mathematician, and philosopher, he is best known as a poet. His masterpiece, *Hercules*, a didactic hexameter poem, was published in 1653.

Stoat OR **ERMINE** (*Mustela erminea*). British carnivorous mammal of the weasel tribe. It

land, but are not found in Ireland. They hunt by scent, mainly at night, and prey on rats, mice, and voles, and are serious enemies of hares and rabbits. The winter fur is in great demand. See *Ermine*.

Stobart, MABEL ANNIE ST. CLAIR (b. 1862). British organizer. She was the daughter of Sir



Mrs. St. Clair Stobart, hospital organizer

Samuel Boulton, and married (1) St. Clair Stobart; (2) J. S. Greenhalgh. After spending some years in S. Africa, she founded the women's sick and wounded convey corps, of which she commanded a detachment in the Balkan Wars of 1912-13. In the First Great War she organized hospitals (staffed by women) in France and Belgium, was taken prisoner by the Germans, and condemned to be shot as a spy. Released in 1915, she commanded a column of the 1st Serbian English field hospital in what is now Yugoslavia. Interested in spiritualism, she wrote books about it.

Stock (A.S. *stocc*, a stick). Word used in various senses. Its original meaning was that of something thrust into the ground, e.g. the trunk of a tree. From this comes its use for the original part of anything, e.g. the stock from which we are sprung. It has come to be used also for the horses, cattle, etc., kept on a farm (see *Cattle*; *Sheep*). For the financial application, see below; also *Company Law*; *Stock Exchange*.

Stock may be the goods which a tradesman has on hand at any given moment, as in the word *stocktaking*; a stiff band worn as a cravat by a man; and the foundation for soup (*q.v.*).

Stock. In finance, term used for the kind of investors' holding in a company (or in a government or municipality) which is expressed in terms of its face value. It is thus distinguished from a share (*q.v.*), or shares. These are issued and bought as definite units of varying values. Stock can be purchased to any odd amount. In other words, shares are sold by number, stock is sold in quantities of £ s. d. In the U.S.A., the term is not used in

connexion with loans or investment; there, stockholders are those who have purchased an interest in a business concern.

Stock (*Matthiola*). Herbs and shrubby plants of the family Cruciferae. They are natives of S. Europe, W. Asia, N. and S. Africa, two species being British. The popular Brompton stock is a cultivated variety of *M. incana* (British); the ten-week stock is the S.



Stock. Left, flowers of the single *Matthiola annua*. Right, flower spike of the double Brompton stock

European *M. annua*, and the night-scented stocks are *M. odoratissima* and *Hesperis tristis*. Most of the familiar varieties can be sown in the open air like annuals.

Stock. Wooden part of a firearm which supports the barrel and enables the weapon to be held. The stock of a rifle consists of the fore-end, which holds the barrel, and the butt. The barrel is attached to the fore-end by bands. The fore-end is attached to the butt by the stock bolt, the head of which is embedded deep in the butt in the stock bolt hole, in which is kept the oil bottle and the pull-through. See *Rifle*.

Stockade. Improvised defensive wall, which will afford cover to the defenders and also offer an obstacle to any attempted assault. A stockade is of no value against artillery fire, but is particularly useful for passive defence against savage tribes. The construction generally consists of a double wall of wood, bamboo, or corrugated iron, with a packing of earth or shingle between. The term is also used of stakes or piles placed across a harbour or river mouth.

Stockbridge. Market town of Hampshire, England. It stands on the Test, 19 m. by rly. N. of Southampton, and 8 W. of Winchester. It is known as an angling centre and has stables for training racehorses. There is a modern church, S. Peter's, and a town hall. Until 1832 Stockbridge sent two members to parliament. Market day. Thurs. Pop. est. 900.



Stoat. A small red-brown mammal whose coat in winter becomes yellowish white

is about 10 ins. long in body, with a tail of 4½ ins. The female is 2-3 ins. smaller than the male. In summer the fur is reddish brown above and white below, with white edges to ears and a black tip to tail. The winter coat is pure white or yellowish white, with the exception of the black tip to the tail; in this state the animal is better known as the ermine. Over most of England the seasonal change takes place only partially; but in Scotland and the N. countries generally it almost always occurs. The animal makes its home in hollow trees and in holes in banks, and here a nest of grass and leaves is formed for the young, which are born about April. Stoats are fairly common in England and Scot-

Stock Exchange (French, *bourse*; Ger., *börse*). Building in which stocks, shares, and negotiable securities are bought and sold. There are stock exchanges in London, Manchester, Birmingham, Glasgow, Cardiff, and other cities of the U.K.; in Montreal, Sydney, and Johannesburg; in New York and other American cities; and in Paris and other capitals and principal cities of W. Europe. The New York stock exchange is often referred to as Wall Street, from the situation of the building; it is one of the most important and most highly organized and mechanised markets in the world. Each stock exchange has its own rules governing membership and the conduct of business; but the general principles are similar, except that only the London stock exchange divides its members into two classes, dealers (or jobbers) and brokers. The former specialise as dealers or wholesalers in a particular range of securities, or market, buying and selling on their own account; the latter act as buying or selling agents for the public, receiving a commission for their services. They are thus the intermediaries between the public and the jobbers.

Buying and selling of securities developed about the time of the institution of the National Debt and the foundation of the Bank of England in 1694. Early in the eighteenth century stock-jobbers and stockbrokers met in Change Alley and the coffeehouses there, particularly Jonathan's and Garraway's. In 1801 the stock exchange was built of veined marble with a floor space of 25,000 feet, and a dome 100 feet high. The settling room is below. Strangers are not admitted to the floor of the house.

The London Exchange

The London stock exchange is owned by a company; for many years a board of trustees and managers, elected by the proprietors, controlled the building and managed the business side of the exchange, deriving the income from entrance fees and subscriptions of members, etc., and attending to the finance of the institution; while a committee for general purposes, elected annually, controlled the activities of members. After the Second Great War, however, it was decided to merge this dual control in one authority, the council of the stock exchange, which is elected annually. It is responsible for making, altering, and enforcing the official rules.

Members number about 4,000. Admission to membership, which requires heavy fees and sureties, is restricted to those who have served for four years as authorised or unauthorised clerks; and those who purchase a "nomination" of a deceased or retired member. Membership is for one year only, re-election being at the discretion of the council. Before re-election each member must state whether he proposes to act as a broker or as a jobber: the two functions are rigidly separated.

Making a Bargain

A person wishing to buy or to sell certain securities must employ a broker to act for him. The broker or his clerk goes to the part of the house where the jobbers who specialise in that kind of security are, and asks one of them to "make a price" in the security. The jobber then quotes two prices, say, 56s. 3d.-56s. 9d., the first being the price at which he will buy, the second the price at which he will sell. The difference between the two prices is sometimes called the "jobber's turn"; it represents his profit on each share. The broker is expected to make the best possible bargain for his client, and may ask for a narrower price. Certain transactions must be recorded (or marked); others may be. Such markings of bargains are the basis of the business done included in the daily official list, and the stock exchange prices published in some newspapers.

When the broker is satisfied with a price he sends his client a contract note, showing the exact nature and result of the transaction.

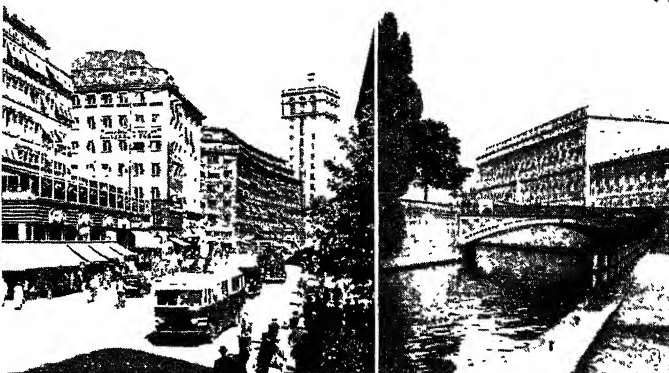
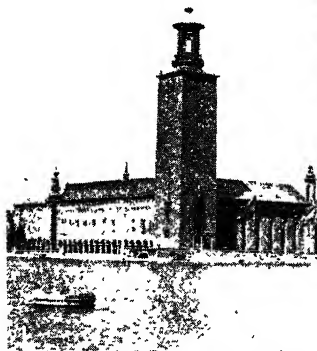
On settlement day securities have to be delivered, as well as cash paid. If they are bearer securities, the selling client merely hands them to his broker, and they are passed on to the buyer; if they are inscribed securities, the selling client (or his attorney) has to attend at the Bank of England or other office of the registrar, to be identified by his broker, and sign them away; if they are registered securities, both buyer and seller sign a deed of transfer prepared by the stockbroker. The broker of the selling client sees that the seller's share certificate is handed over and that it is cancelled by the company whose shares it represents; the broker of the buying client sees that his buyer is subsequently supplied from the company's office with a certificate for the shares bought.

During the Second Great War all transactions were made on a cash basis, and theoretically had to be completed within five days; but in 1946 the council reverted to the practice of fortnightly accounts: that is, the year is divided into fortnightly periods (accounts), and a transaction has to be completed on the last day of the account in which it occurs; the document relating to the security has to be handed over to the buying member and the cash has to be paid to the selling member. Before the war it was possible to arrange to "carry over" a transaction from one account to the next. A client who did not wish to complete his transaction could arrange for his broker to complete the bargain within the exchange and immediately to re-open it for the next account.

"Bulls" and "Bears"

This arrangement facilitated speculation by "bulls," those who think the price of a security will rise and who in consequence buy in the expectation that they will be able to sell at a profit before they are called upon to pay, and by "bears," those who think the price of a security will fall, and who therefore sell shares they have not got in the expectation that before they have to deliver the shares they will be able to buy them at a lower price. The bull who carried over his bargain had to pay the difference between his buying price and the making up price at the end of the account, plus interest, called *contango*; the bear who carried over could be in a worse plight: his broker had to find someone who was prepared to provide the stock, and the holders of stock sometimes charged heavily for the accommodation. The charge was called *backwardation*.

The council of the stock exchange, through the official rules, states in detail the method by which business shall be done, commissions that brokers shall charge and pay, securities that may be dealt in. All the securities are grouped in about 25 well-recognized divisions or markets, such as Gilt-edged, Yankees, South African Mines (the Kafir Circus), Industrials, etc. The council does not guarantee any of the securities; but has an elaborate code of rules that must be observed before dealings may begin; and an even more stringent set of regulations governing the grant of an official price quotation, i.e. the inclusion of the security among those officially quoted in the stock



exchange daily official list. Business is permitted in the house in numerous unquoted securities; but many others may not be dealt in.

The values of stock exchange securities vary from time to time, sometimes considerably. Each security represents a probability to the right to an estimated income and, in some cases, to the repayment of capital. Any news that suggests that the estimated income will be larger tends to increase the market value. Consequently some fluctuations in stock exchange values are anticipations of the effect of news. Again, if the current rate of interest falls from, say, 4 p.c. to 3 p.c., a larger capital is necessary to earn a stated income; thus, at 4 p.c. £100 yields £4 income, but at 3 p.c. £133½ is needed to secure £4.

Value of fixed income stocks tends to rise as interest rates fall, and vice versa. Securities can be regarded as commodities having specialised supply and demand conditions of their own. Also, except when a security is sold *ex-dividend*, the purchaser acquires both the security and the right to the next dividend or interest payment; the price therefore includes an allowance for this accrued dividend or interest. In addition, stock exchange prices from time to time reflect the dealers' reaction to the political situation, the policy of institutional investors, such as banks, insurance companies, etc., and the abundance or scarcity of ready money. Consult the Stock Exchange Official Rules; Stock Exchange Daily Official List; Stock Exchange Weekly Official Intelligence; The Work of Wall Street, S. S. Pratt, 1903; The Book of the Stock Exchange (3rd ed.), F. E. Armstrong, 1943; The Stock Exchange, W. T. C. King, 1947; The Stock Exchange, H. Wincott, 1947.

H. Watson



Stockholm, Sweden. 1. The town hall. 2. Kungsgatan, the busiest thoroughfare in the capital. 3. The royal palace. 4. General view from S. Catherina terrace

Stock-fish. Term applied to fish such as cod, ling, and other members of the cod family, when split, cleaned, dried, and salted for export.

Stockholm. Capital of Sweden, and its largest city. Its situation on islands and mainland at the influx of Lake Malar into the Baltic makes it one of Europe's most imposing cities. Stockholm is connected by rly. with Malmö and Gothenburg, and also with Oslo and Trondjhem.



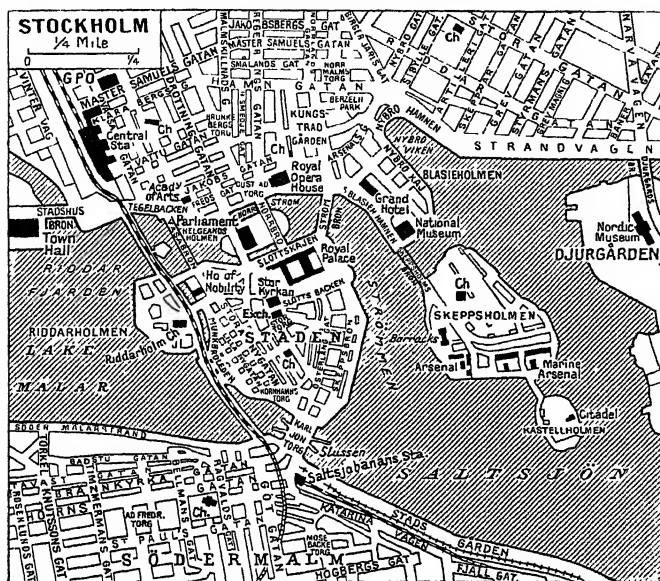
Stockholm arms

The city is composed of several districts: (1) the "old town," on Stadholmen and Helgeandsholmen, containing the royal palace and most of the government offices; (2) Norrmalm, to the N., the commercial and financial centre, where are also the chief newspaper offices; (3) Östermalm, mainly residential and military; (4) Kungsholmen, to the W., headquarters of municipal administration; (5) Södermalm to the S.,

industrial and residential; and (6) the newer garden suburbs farther W. and S., including Bromma and Spånga, incorporated into the city at the beginning of 1949. At Bromma is situated the Stockholm airport.

The pop. at the end of 1947 was 703,000 approx. More than one-third were living in the garden suburbs, and this tendency has noticeably increased, necessitating developments in external communication. An underground rly. was under construction in 1948.

Stockholm, as befits the most important trading town in Sweden, has a magnificent harbour. Main imports are coal and coke, oils and rubber, metals, grain, chemicals, and groceries; main exports are ores and minerals, metal products, pulp, paper, and cardboard, and machinery and tools. The city's own industries include the manufacture of metal goods and machinery, including electrical and telephone equipment, paper, textiles and garments, and provisions. There are important printing and industrial chemical works.



Stockholm. Plan of the Swedish capital, showing the old town on Lake Malar and its suburbs on each side of the harbour

Chief buildings include the royal palace, built 1697-1754, in Renaissance style; the Gothic (13th cent.) Riddarsholm church, burial place of Sweden's kings; the Riddarhuset (house of nobility) in Dutch classical style, containing a collection of armorial bearings; the houses of parliament (1898-1905); the bank of Sweden (1894-1906); in Normalm, the Royal Opera House, the national museum, the concert hall (1926), and the city library, an early example of "functional" architecture, built 1924-27; in Östermalm, the national library (700,000 books and 12,000 MSS.), the technical college, and the stadium; and in Kungsholmen, the town hall, completed in 1923, an internationally famous example of modern architecture. The "south town hall," in Södermalm, was erected in the 17th century. The island of Kastellholmen, S.E. of Normalm, is a naval station. The royal deer park, S.E. of Östermalm, is a popular place of resort, in which is situated the Nordic museum. Close by is an open-air museum and zoo.

According to tradition, Stockholm was founded by Birger Jarl in 1255. The oldest charter extant is dated 1436. In 1520 the town surrendered to Christian II of Denmark, who ordered mass executions of the nobility (Stockholm's "blood bath"). A peaceful period began with the entry of Gustavus Vasa in 1523. The 17th

century saw the govt. of the kingdom centralised in Stockholm, which then first became the official capital. The abolition of the guild system in 1846, and the consequent freedom for inhabitants to choose their own means of livelihood, led to a remarkable increase in the pop., which grew from 93,000 in 1850 to 301,000 by 1900.

Stockholm, TREATY OF. Agreement concluded between Great Britain and Sweden, Nov. 20, 1719. By it George I obtained for Hanover the duchies of Bremen and Verden, and Stettin for his ally, the king of Prussia. There were also treaties of Stockholm between Sweden and Russia, March 24, 1724; Sweden and Great Britain, March 3, 1813; Sweden, France, and Great Britain, Nov. 21, 1855.

Stockings. Close-fitting knitted coverings for the leg and foot.

Until the 16th cent. stockings were of cloth. Queen Elizabeth was presented by Mistress Montague with "a pair of black knit silk stockings which pleased her so well that she would never wear any cloth hose afterwards." In the 20th cent. good quality stockings, whether of silk, rayon, nylon,

cotton, or wool, are "fashioned," i.e. shaped so that they fit closely over the calf. This process requires special machinery and skilled operatives, and during and for some time after the Second Great War shortage of skilled workers in the U.K. led to the production in that country for home consumption of many more unfashioned stockings than in normal pre-war years. Clocks, formerly often seen on stockings and socks, seem to have been a survival of the days of cloth stockings, for the word signifies a gore or seam, embroidery being used to cover the join. See Hose; Hosiery.

Stockmar, CHRISTIAN FRIEDRICH, BARON VON (1787-1863). German adviser of Queen Victoria.

Born at Coburg, Aug. 22, 1787, of a noble family of Swedish origin, he studied medicine, and became physician and adviser to Prince Leopold of Saxe-Coburg.

He promoted the candidature of Leopold as king of the Belgians, and was recommended by that prince to his niece Victoria, on her coming of age, as political tutor. During the first months of the queen's reign Stockmar remained at the English court in an unofficial capacity, and later passed a good deal of time in England as a personal friend of the sovereign and the prince consort. He died at Coburg, July 9, 1863.

Stockport. County borough of Cheshire and Lancashire, England. Standing where the Goyt and Tame unite to form the Mersey, it is 6 m. S.E. of Manchester and is a rly. centre, with stations at Edgeley and Tiviot Dale. Buses and trams connect it with Manchester and



Baron von Stockmar, German statesman



Stockport, Cheshire and Lancashire. The town hall

other places. The buildings include S. Mary's church, with a 13th century chancel, the modern town hall, and the grammar school founded in 1487. There is a museum in Vernon Park. The large Sunday school is a feature of the town. Stockport is built on the sides of a

Stockport arms

narrow ravine, which is crossed by several bridges. Its industries are engineering, those connected with the cotton manufacture, and making felt hats. Heaton Norris and Reddish are the parts in Lancashire, being on the N. side of the Tame. Originally a Roman station, Stockport was made a borough in the 13th century. Since 1832 it has sent two members to parliament. Market days, Fri. and Sat. Pop. est. 142,540.

Stock Prize. French literary award, formerly called the Femina-Vie Heureuse prize. Awarded annually and worth £40, it was presented by the French magazines Femina and Vie Heureuse for what the selection committee considered the best work of imagination by one of the younger British authors, or one deemed not to have received adequate recognition. A reciprocal English prize for French authors, later called the Heinemann prize, was combined with the other in 1935 as the Stock-Heinemann prize. Awards were suspended for the duration of the Second Great War. The prize was first won in 1919 by Cicely Hamilton's William an Englishman. Other successful authors were Rose Macaulay, Gordon Bottomley, E. M. Forster, Mary Webb, Virginia Woolf, H. M. Tomlinson, Charles Morgan, Richard Hughes, Stella Benson, Richard Church, and Robert Graves.

Stock Raising. On this industry, see entries on the various classes of livestock, e.g. Cattle; Sheep, etc.

Stocks. Wooden structure for confining the legs, formerly employed as a mode of punishment. Stocks consisted of two pieces of wood, fitting edge to edge, with semicircles cut out of the contiguous edges just large enough to hold a man's ankle and keep it securely when the boards were locked together. The stocks were frequently on the village green, and seated on a bench or on the ground, with his ankles and sometimes his wrists confined, the offender was exposed to the jeers of all who passed by. Almost universally

used for minor offences, stocks were first employed in England in Saxon times, and were later set up in every village. This method of punishment fell into disuse in the early 19th century. There are still stocks, with whipping posts attached, in many English villages, though the last in London was removed from S. Clement Danes, Strand, in 1826. See Pillory.

Stocksbridge. Urban dist. of Yorkshire (W.R.), England. It is 8 m. from Sheffield, and is a coal-mining centre, having also iron and steel works. Pop. est. 9,000.

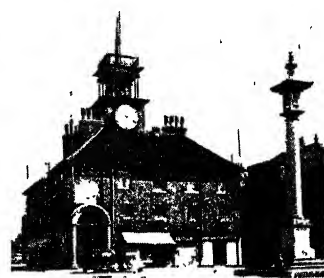
Stockton. City of California, U.S.A., the co. seat of San Joaquin co. It stands on a branch of the San Joaquin river, 80 m. E.N.E. of San Francisco, and is served by the Atchison, Topeka, and Santa Fé and other rlys. It trades in grain, fruit, and cattle, and manufactures mining and farming implements, foundry, machine-shop, and lumber products, leather, flour, and soap. These products of the rich San Joaquin valley are shipped from a water-front 18 m. long. Settled in 1847, Stockton became a city in 1850. Pop. 54,714.

Stockton-on-Tees. Mun. borough and seaport of Durham, England. It stands on the Tees, 4 m. from its estuary and 4 m. from Middlesbrough. It is served by rly. The chief buildings are the town hall, exchange, free library, and other public buildings. Ropner Park is one of several recreation grounds. The chief industries are blast furnaces, ironworks, foundries, machine shops, and glass works. There is some shipping,



Stockton-on-Tees arms

coal being exported. Thornaby-on-Tees is across the Tees in Yorkshire. Stockton was made a borough in the 14th century and had a castle which was taken by the parliamentarians in 1644. Since 1867 it has sent one member to parliament. From here to Darlington ran the first passenger railway line in England, opened Sept. 27, 1825. A mile to the N. is Norton, where is a fine old church, S. Mary's. Market day, Wed. Pop. 67,697.



Stockton-on-Tees, Durham. Town Hall, and Doric column erected as a market cross

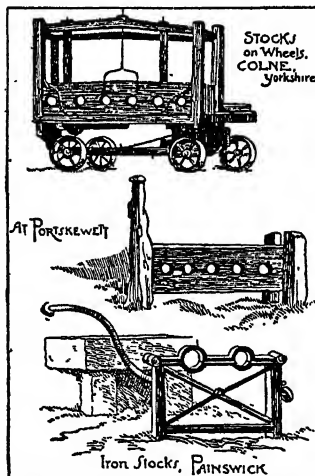
Stockwell. Dist. of S.W. London. In the bor. of Lambeth, it lies between Clapham, S., and N. Brixton, N. Here was the Stockwell Orphanage, founded in 1867 by C. H. Spurgeon, which maintained some 500 children. At the outbreak of the Second Great War it was closed, the children being sent to Reigate and Birkington; they were not brought back to Stockwell after the war. In Landon Road is the South-Western Fever Hospital, established in 1877. Stockwell station is on the Morden-Edgware underground rly.

Stock Yard. Open, covered, or partly covered space in which cattle are kept when not on the land. See Farm.

Stoddart, ANDREW ERNEST (1864-1915). British sportsman. He was born at S. Shields, March 11, 1864, and in 1885 joined the Hampstead C.C., making his first appearance for Middlesex. He went to Australia with the 1887-88 and 1891-92 teams, and in 1894-95 and 1897-98,



A. E. Stoddart, British sportsman



Stocks formerly used for the punishment of minor offenders, still existing in a few English villages

when he was captain. A hard-hitting batsman, and a fair change bowler, he was for years the mainstay of the Middlesex team. Playing for Hampstead against the Stoics on Aug. 4, 1886, he scored 485 out of 814. He was also one of the finest of Rugby Union players, taking part in ten international matches. He died April 3, 1915.

Stoicism (Gr. *stoa*, porch). Greek philosophical system, a development of Cynicism. Founded at Athens by Zeno of Citium in Cyprus, about 300 B.C., it divided philosophy into logic, physics, and ethics. Logic furnishes the means of acquiring true knowledge. All knowledge comes from sensual perceptions, which the understanding combines into general notions, but only those perceptions and notions are true which irresistibly carry conviction. Physics teaches the laws of the universe. Only bodies (including feelings and attributes), things which act and feel, are real. There are two principles of things: passive matter and active God, the soul and former of the universe. God is a living fire (also called aether), the universal intelligence. Man's soul is a fiery vapour, partly divine, but perishable.

Ethics provides rules for practical life. The laws of nature being the laws of God, virtue consists in living according to nature in rational action. Pleasure is not an end, but rather an evil than a good. Virtue alone brings happiness; external possessions are indifferent. There is no mean between virtue and vice; a man is wholly virtuous or wholly vicious. The wise man is the pattern of virtue, the ideal of all classes of mankind, free from all faults, weaknesses, and passions, free from external restrictions, happy in all conditions. The Stoics thought suicide permissible as an aid to independence. Many distinguished Romans were followers of Stoicism—Cato of Utica, to some extent Cicero, the poet Lucan, Seneca, the emperor Marcus Aurelius. The modern definition of stoicism as indifference to pleasure and (especially) pain, accentuates the idea that the wise man is independent of all bodily conditions and external relations. See Ethics; Philosophy.

Stoke. English place-name. It is generally regarded as meaning a fenced place, being thus connected with the word stockade. Stoke-on-Trent is entered thus. Stoke in Notts, 4 m. E. of Newark, was the scene of the battle wherein Henry VII defeated the forces of



Stoke Newington. Parish church of S. Mary, designed by Sir Gilbert Scott, seen from Clissold Park

Lambert Simnel (*v.i.*). Stoke d'Abernion, Surrey, has in its church the oldest brass in England, that of Sir John d'Abernion (see Brasses). See Stoke Poges.

Stoke, BATTLE OF. Fought between Henry VII and a force of foreigners and rebels raised in the interest of Lambert Simnel, June 16, 1487. The force, collected mainly in Burgundy by Henry's enemies, landed in Dublin in May. Its backbone was composed of 2,000 German mercenaries. A number of Irishmen joined them, and in June the army landed in Lancashire. After manoeuvring for position, they faced Henry's forces at Stoke in Notts. The battle between the Germans and Henry's own division of men-at-arms was fierce. Losses on both sides were heavy, but at last the rebels broke and fled.

Stoke Newington. Met. bor. of the co. of London. It includes the old parish of the same name, to which in 1900 was joined the urban dist. of S. Hornsey, and has Islington W. and Hackney E. British Railways, buses, and trolley buses connect it with the City of



Stoke Newington arms

London. The 16th century church of S. Mary, which has interesting monuments, was superseded as parish church by the spacious Early Decorated structure of Sir Gilbert Scott, consecrated in 1858. Both churches were damaged in air raids in 1940. Clissold Park, through

which winds the New River, was acquired for the public for £96,000 and opened 1889. To the N. of the park are works of the M.W.B. and New River reservoirs; to the E. is Abney Park cemetery (*q.v.*), occupying the site and grounds of Abney House, built in 1669. There are a town hall, assembly hall, and public library. The district has included among its residents Gen. Fleetwood, Isaac Watts, Isaac D'Israeli, Poe, John Howard, the philanthropist, T. Day, author of Sandford and Merton, Mrs. Barbauld, and Defoe, after whom a street is named. It joins with Hackney N. to elect an M.P. Pop. 46,700.

Stoke-on-Trent. Full name of the city and co. bor. of Staffs, England, which in 1910 was



Stoke-on-Trent arms

formed by amalgamation of the boroughs of Burslem, Hanley, Longton, and Stoke-upon-Trent, and the urban dists. of Fenton and Tunstall. This city is the headquarters of the pottery industry of Great Britain, and lies about 150 m. N.W. of London by rly. Three members are elected to parliament by a pop. est at 274,000. See separate articles on each former borough; also Five Towns.

Stoke Poges. Village of Bucks, England. It is situated 20 m. W. of London, and 2 m. N. of Slough rly. station. The chief building is the church of S. Giles, parts of which are Norman and Early English. This has memorials of the family of Moleyns, and its churchyard was the scene of Gray's *Elegy*, also the burial place of the poet. In 1921 land near the churchyard was vested in the National Trust. See Gray, T.



Stoke Poges, Bucks. The parish church of S. Giles, and the churchyard which inspired Gray's *Elegy*

Stoker. Attendant of a hand-fired solid-fuel-burning furnace who feeds fuel into the fire, periodically freeing the grate of ash and clinker. Men so employed are known as stokers in warships, and as firemen in the merchant navy and in land installations. The increasing use of pulverised coal and oil fuel for steam raising, and of internal combustion engines of the diesel type for ship propulsion, have greatly reduced the heavy labour of the manually-operated furnace. In modern installations fuel and air supplies may be varied to suit fluctuations of load by valve manipulation at a central control panel, incorporating dial indicators that show, and often record, the condition existing in every part of the plant.

The term is also applied to mechanical devices supplying solid fuel to furnaces. Three principles are employed in mechanical firing; overfeeding, coking, and underfeeding. Overfeed stokers throw fuel over the firebed by means of moving shovels or rotary distributors, and normally incorporate a fuel hopper from which graded coal falls to the distributing mechanism. These stokers imitate one or other of two systems of hand firing, the spreading method in which coal is spread equally over the firebed, or side-firing in which fuel is thrown over the right and left sides of the fire alternately, so that one half is always in good condition, and able to burn the volatiles given off from the coal last added to the other side.

Coking stokers imitate another method of hand firing, that of distilling volatiles from fresh fuel on the front firebars, and burning these over the incandescent bed before burning the residual coke. Underfeed stokers have no parallel in hand firing. Graded coal passes from a bunker or hopper along a horizontal duct, containing a slowly-turning helically-finned shaft, to the bottom of a basket-like retort in the middle of the combustion chamber. As the fuel is forced upwards to the fire, the volatiles are released just below the level at which air enters the grate, and burn in the upper incandescent layer of previously coked coal. The ash, largely fused to clinker, is pushed on to a firebrick bed surrounding the retort.

J. W. Cowan, A.M.I.E.H.V.E.

Stokes, SIR GEORGE GABRIEL (1819-1903). British mathematician and physicist. Born at Skreen, co. Sligo, Aug. 13, 1819, and educated at Bristol and Pem-



Sir George Stokes, British mathematician

Rumford medal of the Royal Society, 1851, for his study of fluorescence, became secretary of the society in 1854, and president, 1885-90. He received the Copley medal of the society, 1893, and was honoured during his lifetime by every important scientific body. During 1887-91 he represented his university in parliament. He died at Cambridge, Feb. 1, 1903.

Stokes was one of the most brilliant mathematicians of the 19th century, and a great personal friend of Lord Kelvin. To him is due the modern theory of motion of viscous fluids, on which he published papers in 1845 and 1850, while in optics his theory of diffraction opened up hitherto unexplored fields of research. He was the practical founder of the science of geodesy, discoverer of the nature of fluorescence, and an original and brilliant investigator. His works were published in five vols., 1880-1905, as *Mathematical and Physical Papers*. See Stokes's Law, Stokes's Theorem.

Stokes, WHITLEY (1830-1909). Celtic scholar. Born in Dublin, and educated at the university, where his father was professor of physics, during 1862-82 he lived in India, where he held several important posts, and drafted the codes of civil and criminal procedure. His reputation, however, rests upon his numerous works connected with the Celtic languages—Irish, Breton, and Cornish. He died in London, April 13, 1909.

Stokesay. Village of Shropshire, England. The village, 6½ m. N.W. of Ludlow, has a church dating from the 17th century, and is famous for its castle. It is a fine example of a fortified residence of the 13th century, and is surrounded by a moat. The great banqueting hall and solar are notable. The rly. station for the village is known as Craven Arms and Stokesay. Pop. 1,100.

broke College, Cambridge, he was senior wrangler and first Smith's prize-man, and was appointed Lucasian professor of mathematics at Cambridge, 1849. He was awarded the

Stokes Gun. Type of trench mortar. Designed by Sir Wilfred Stokes (1860-1917) in 1915, this mortar was largely used in trench warfare in the First Great War, with deadly effect. It consisted of a steel barrel terminating in a breech fitted with a fixed striker. The upper part of the barrel had a sliding pin across its diam.; this could be withdrawn by pulling a lanyard. The projectile, a cylindrical case containing a charge of high explosive and an impact fuse, had at its base a 12-bore cartridge fitted with a propellant charge. When the projectile was placed in the barrel it rested on the sliding pin until the lanyard was pulled, when it fell to the breech. The cartridge in the base touched the striker, to ignite the propellant charge and blow the projectile out of the barrel. The mortar had a rate of fire of 40 r.p.m. and an effective range of 300 yds. The ordinary infantry Stokes gun fired a 20-lb. projectile, but a howitzer type discharged a 150-lb. bomb. All were already replaced before the Second Great War by the more accurate 2-in. to 6-in. mortars. See Mortar.

Stokesley. Market town of Yorkshire (N.R.), England. It stands on the Leven, in Cleveland, 16 m. S.E. of Stockton-on-Tees, with a rly. station. The old church of S. Peter was rebuilt in the 18th century, and there are a town hall and an endowed school. Around are ironstone mines. Market day, Mon. Pop. 1,700.

Stokes's Law. Principle of physics formulated by G. G. Stokes (v.s.) which relates to the resistance experienced by a body when moving through a fluid medium at moderate velocities. If the body is spherical and of radius r , if v is its instantaneous velocity and η the viscosity of the medium, then the resistive force experienced is given by $F = 6\pi\eta rv$.

Stokes's Theorem. In mathematical physics, statement that



Stokesay, Shropshire. The old gatehouse of the castle, a superb example of the timbered architecture characteristic of this part of England

the surface integral of the curl of a vector field **A** taken over any surface is equal to the line integral of **A** taken around the periphery of the surface.

Stoke-upon-Trent. Part of the city of Stoke-on-Trent, Staffs, England. In the centre of the Potteries, it is 146 m. N.W. of London, and is well served by rly. and on the Grand Union Canal. Stoke owes its growth entirely to the pottery industry started by Josiah Wedgwood. Before the introduction of this in the 18th century it was a country village. In 1832 it began to send members to parliament—until 1950 it had one of the city's three; in 1874 it received a bor. charter, and in 1910 became part of the co. bor., later city, of Stoke-on-Trent. Principal buildings are the town hall, partly dating from 1834; the church of S. Peter ad Vincula; N. Staffs royal infirmary; N. Staffs technical college, opened 1914; Minton art school (1856), commemorating a celebrated potter; assembly hall; and public library.

Stokowski, LEOPOLD ANTONI STANISLAW BOLESŁAWOWICZ (b. 1887). American conductor. Born



Leopold Stokowski, American conductor

in London of Polish parents, he received training at the R.C.M. before going to America. He possessed all-round musical ability combined with a flair for orchestral management, and at 22 was chosen conductor of the Cincinnati orchestra. From 1913 to 1936 he was in charge of the Philadelphia orchestra. In 1915 he became an American citizen. With Deanna Durbin he appeared in the film *A Hundred Men and a Girl*, 1937, and with Walt Disney he made the cinema classic *Fantasia* (q.v.), 1941, conducting his own transcription of Bach's toccata and fugue in D minor.

Stolberg, CHRISTIAN, COUNT VON (1748–1821). German poet. Born at Hamburg, Oct. 15, 1748, and educated at Göttingen, he became one of the patriotic literary group known as the Hainbund (Sylvan League). In the public service of Holstein,

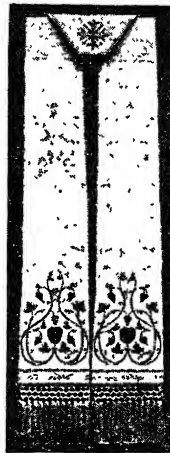


Count Stolberg, German poet

1777–1800, he died Jan. 18, 1821. Besides writing poems and dramas, he made translations from the Greek, his translations of Sophocles, 1787, becoming a standard work.

A brother, Friedrich Leopold Stolberg (1750–1819), also a poet of the Göttingen school, was born at Bramstedt, Holstein, Nov. 7, 1750. During 1777–1800 he filled various diplomatic positions, and he died Dec. 5, 1819. He wrote poems on freedom, made translations from the Greek, and wrote a novel, *Die Insel* (The Island), 1788, and a *Life of Alfred the Great*, 1815.

Stole (Lat. *stola*, long robe). Ecclesiastical garment. Originating in the Roman *lorum*, a long scarf worn as a sign of office by magistrates and officials, it is from 3 ins. to 4 ins. wide and, when passed over the neck, each end reaches to about the knee. The ends are often ornamented and in the R.C. ritual the colour varies according to the season.



Stole used in the Anglican Church
Courtesy of A. & R. Mowbray, Ltd.

Stolen Goods. By English law, the property in stolen goods remains in the lawful owner; and he may recover them from whomsoever has them, however much the possessor may have paid for them. To this rule there is a common law exception. When the goods have been sold in market overt (q.v.) the property passes to the buyer, provided, however, that, if the true owner of the goods prosecutes the thief to conviction, the goods revert in the true owner.

Stoll, SIR OSWALD (1866–1942). British theatre proprietor. Born in Melbourne, Australia, Jan. 20, 1866, he was educated at Liverpool and assisted his mother in the management of the Parthenon music hall there. He became a variety agent, and in the 1890s opened the Empire, Swansea, and Empire, Newport, where he introduced two houses a night. In 1900 Stoll's interests were merged with the Moss and Thornton management, the combination known as Moss Empires Ltd. being launched,

the London Hippodrome opened, and the Coliseum built. He left the organization to take over management of the Coliseum.

later obtaining control of the Alhambra and the London Opera House, which was converted into a cinema (see Stoll Theatre). He became chairman of



Sir Oswald Stoll, British theatre proprietor

two film companies. During the First Great War he initiated a scheme to provide and maintain houses for disabled ex-officers and their families, and he was knighted in 1919. He died Jan. 10, 1942.

Stoll Theatre. London playhouse in Kingsway, W.C.2. Designed by Bertie Crewe and erected by Oscar Hammerstein for the production of opera, it was known as the London Opera House and opened Nov. 13, 1911, the first production being *Quo Vadis*? Hammerstein's ambition to make his theatre a parallel to Covent Garden proved unsuccessful, and the building was closed in 1913, to be reopened next year as a variety theatre. After the First Great War it was converted by Sir Oswald Stoll into a cinema and renamed the Stoll Picture Theatre. During the Second Great War it staged variety and concerts, and ice entertainments were a later novelty.

Stolp (Pol. *Slupsk*). Town of E. Europe, in that part of Germany placed under Polish rule by the Potsdam agreement, 1945. It stands on the Stolpe, 85 m. W. of Danzig. The chief buildings are the churches of S. Mary (14th century), with a lofty tower and a fine carved pulpit, and S. John (15th century); the castle, a 16th century building; and the modern town hall. The manufactures of Stolp included cloth, paper, machinery, and leather. Its port is Stolpmünde (Pol. *Ustka*), at the mouth of the Stolpe, 10 m. N. of the town. Stolp was in the Middle Ages a member of the Hanseatic League and a fortified town. It was in the duchy of Pomerania, passing to Prussia in 1637. Its capture by the Russians March 9, 1945, cut off the Germans in the Danzig area. Pop. (1935) 45,507.

Stomach (Gr. *stomachos*, from *stoma*, mouth). In man, the receptacle for food after it has been swallowed. It is the most dilated part of the alimentary canal. The stomach is roughly conical in shape,

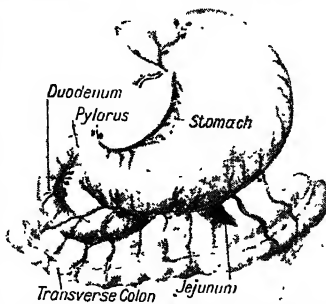
the base or fundus being on the left side of the body. The upper border is concave and is called the lesser curvature; the lower border is convex and is known as the greater curvature. The oesophagus or gullet opens into the upper part of the fundus by means of the cardiac orifice. The right extremity of the stomach is known as the pylorus and passes into the duodenum, the beginning of the small intestine.

The stomach is about 10 to 12 ins. long, and 4 to 5 ins. in diameter in the widest part. It lies beneath the diaphragm, or broad horizontal muscle, and is in close relation with the liver and pancreas. It is supplied by the pneumogastric nerves and the sympathetic nerve system. Externally the stomach is covered almost completely by the peritoneum. Beneath this are three muscular layers, and internally the organ is lined by mucous membrane, which contains three varieties of secreting glands.

The mixed secretion forms the gastric juice, which plays an important part in digestion. It is antiseptic, owing to the presence of hydrochloric acid; it converts sucrose into glucose and fructose; splits fats into simpler bodies; curdles milk; and converts the proteins of food into peptones, which are soluble. The digestion of food in the stomach is assisted by movements in the stomach, which mix the different constituents together and gradually pass them on into the intestines. The average time taken for the complete emptying of the stomach after a meal is about three hours.

Ulceration of the stomach is a disorder met with in both sexes. The cause is unknown, but the complaint is specially associated with arteriosclerosis, chronic indigestion, and worry. The ulcer is usually on the pyloric end. Most cases recover with appropriate dieting and medicinal measures. In severe cases an operation for excision of the ulcer may be necessary. Perforation of the ulcer may cause death from peritonitis, or a large blood-vessel may be eroded and death occur from haemorrhage. Cancer of the stomach most usually affects the pyloric end, and is more frequent in males than in females. See Anatomy; Dyspepsia; Gastritis; Man.

Stomach Pump. Instrument for removing the contents of the stomach in cases of poisoning. It is now rarely used, having been superseded by syphonage by means of a simple indiarubber tube terminating in a glass funnel.



Stomach. Diagram of the human organ, showing its blood and lymph supply and its relation to the intestines

Stomata (Gr., mouths). In botany, term applied to minute openings in the epidermis of leaves through which air is admitted to the cellular tissues (see Mesophyll), and excess of water evaporated. The slit-like opening is bounded by two kidney-shaped guard-cells with their concavities facing. When these guard-cells are turgid with moisture the stoma is open; when there has been excessive transpiration, the guard-cells become more flaccid and the opening is closed. **Stomata**, though found on both surfaces of the leaf, are far more abundant on the lower side. See Potato.

Stone. Measure of weight. The standard British stone of 14 lb. is known as the imperial stone. Other stones in use vary in weight according to the substances weighed, and often according to the locality. A butcher's and fishmonger's stone is 8 lb., that for cheese 16 lb., for hemp 32 lb., and for wool 24 lb. See Weights and Measures.

Stone. In geology, small fragment of rock. The name is applied particularly to small weather- or water-worn fragments, and also to those portions of rocks which are shaped and dressed for building, i.e. building stones. Stones for particular uses are generally designated by some qualifying word, e.g. hearthstone. Precious stones are those minerals, as diamonds, rubies, etc., distinguished by their beauty, colour, and rarity. The word is also applied to the hard kernels of certain fruits, e.g. cherry stones. See Building Stones; Geology; Precious Stones; Quarrying; Rock.

Stone. In pathology, a hard concretion formed in the kidney or bladder and much less frequently, in other organs. Gout is probably the most frequent cause, but stones may result from any faulty metabolism of salts and minerals. See Bladder; Calculus; Kidney.

Stone. Urban dist., and market town of Staffordshire, England. It stands on the Trent, 7 m. N. of Stafford, and has a rly. station at a main line junction. The chief buildings are the church of S. Michael, the successor of the abbey church, S. Dominic's priory, a town hall, market hall, and a grammar school of 1558. The industries include brewing, glass making, ceramics, and making footwear. Stafford and Stone is the name of a co. constituency. Market day, Tues. Pop. est. 8,500.

Stone. River of Tennessee, U.S.A. It flows N.W. to join the Cumberland river, about 5 m. above Nashville.

The battle of Stone River was a Federal victory in the American Civil War, also known as the battle of Murfreesboro. It was fought Dec. 31, 1862-Jan. 2, 1863. The Tennessee army, numbering 38,000 under Bragg, after their retreat from Kentucky, had taken up position at Murfreesboro. After preliminary skirmishing Rosecrans, the Federal general, at the head of 47,000 men, advanced against Murfreesboro, Dec. 29, and two days later the Confederates attacked the Federal right. At first the Southerners were successful, but when night fell they had not only been held along the line but repulsed at several points. On Jan. 2 Bragg renewed the attack, but the Federals advanced across the river, and the next day entered Murfreesboro. The Federals lost 13,000 men and the Confederates 11,500 men.

Stone, CHRISTOPHER REYNOLDS (b. 1882). British journalist and broadcaster. Born at Eton, Sept. 19, 1882, and educated there and at Christ Church, Oxford, he became London editor of the Gramophone, probably the first magazine to treat recorded music seriously. This was founded by Stone's brother-in-law Compton Mackenzie. Stone made his name as a broadcaster in the early days of the B.B.C. with his series of programmes of gramophone records interspersed with genial comments, a type of programme which he may be said to have invented and in which he remained for many years without a rival. His easy manner at the microphone recommended him for wide use as a compère of many other types of light radio programmes. A book of broadcast talks, *Christopher Stone Speaking*, appeared in 1933.

Stone, HARLAN FISKE (1872-1946). American judge. Born at Chesterfield, N.H., Oct. 11, 1872

he was educated at Amherst College and Columbia university. He became a lawyer in New York, but returning to Columbia was appointed professor of law, 1902, and dean of the law school, 1910. He went back to private practice, 1923. The following year he was appointed attorney-general, in 1925 associate justice of the supreme court, and in 1941, chief justice, succeeding Hughes. He died at Washington, April 22, 1946.

Stone, MARCUS (1840-1921). British artist. Born in London, July 4, 1840, a son of Frank Stone,



Marcus Stone,
British artist

artist and close friend of Charles Dickens, he studied under his father, and after considerable work as an illustrator, specialised in sentimental or humorous costume

paintings, a genre in which he excelled, though to many his art became a symbol for all that was most reprehensible in academic "subject" painting towards the end of the 19th century. His large canvases depicting young men and women in fanciful Empire costume under such titles as *In Love*, and *A Lovers' Quarrel*, were no more than large-scale magazine illustrations, and enjoyed great popularity as engravings. Probably his most enduring work will prove to be his illustrations, done as a young man, for the original editions of Dickens's *Great Expectations*, and *Our Mutual Friend*. Stone, who became A.R.A. in 1877 and R.A. in 1887, died March 24, 1921.

Stone Age. Term denoting the earliest phase of human culture, before the use of metals. It was adopted by Thomsen in 1836 when classifying Denmark's prehistoric implements into the threefold sequence of stone, bronze, and iron. But this primeval culture was more comprehensive than the term implies. It utilised wood, bone, horn, shells, and skins, besides witnessing the advent of articulate speech, firemaking, and the expression of the emotions in ritual and art. Hence it is more fittingly designated pre-metallic.

The European Stone Age is divisible into four phases: Eolithic, Palaeolithic, Mesolithic, and Neolithic. The oldest is held to be attested by crude implements revealing traces of artificial fabrication, such as those from the

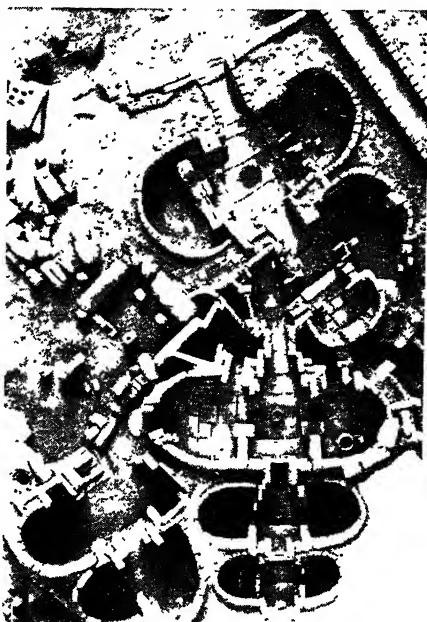
Pliocene near Ipswich and the Red Crag of Foxhill, Suffolk. The Palaeolithic civilization, all within Pleistocene time, has been mapped out, especially in France, into well-defined cultures: Chellian and Acheulian form the lower, Mousterian the middle, and Aurignacian, Solutrian, and Magdalenian the upper division. A Chellian flint workshop was identified at Cromer in 1921.

The primal edged eoliths were universal tools, serving all purposes of splitting and scraping. In the ages before metallurgy was invented man learned to fashion, out of flint and other hard stones, scores of special tools, including chisels, awls, knives, lanceheads, bracers, saws, lamps, and palettes, besides spear-throwers, borers, pins, needles, beads, picks, hafts, harpoons, and cups in other materials. Some of these forms survived through the Mesolithic Azilian and kitchen-midden periods into the lake-dwellings, sepulchral mounds, and pit-villages of the Neolithic age.

This New Stone Age is commonly distinguished from its precursor as that during which many edged tools were made of stones other than flint and were ground and polished. Civilization owes to the Neolithic man the development of pottery and weaving, animal domestication, and navigation.

The later Neolithic Age witnessed the erection of massive stone monuments. These megalithic structures, of which many thousands still stand in Europe and N. Africa, show no trace of metal tooling. In Malta they reached a remarkable development in the temples of Hagier Kim, Mnajdra, and Hal-Tarxien, excavated by T. Zammit in 1920. Their builders ate the flesh of the ox, sheep, pig, and goat, as well as shell-fish, using the shells for personal ornaments.

The dispersion of Stone Age man spread his culture far and wide. It



Stone Age. Implements and remains of early man.

1. Air view plan of Hal-Tarxien temple, Malta.
2. Left, Neolithic pottery bowl, Mortlake, Surrey;
right, Neolithic flint arrowhead. 3. Neolithic
blade with serrated edge

2 and 3 by courtesy of the Trustees, British Museum

is traceable in the prehistory of many Old World regions, remains being found in regions from the Atlas to Japan, from Siberia to Ceylon, which witnessed in their turn the advent of still higher levels of advance. Some peoples drifted into new homes, remote from the main cultural stream, where they remained in complete geographical isolation, e.g. Bushmen and Andamanese, Australians and Maoris, Fuegians and Eskimo. See Anthropology; Archaeology; Art: Prehistoric; Carnac; Cave Dwellings; Kitchen-Midden; Man. Consult The Ancient Stone Implements, Weapons and Ornaments

of Great Britain, J. Evans, 2nd ed. 1897; Prehistory, M. C. Burkitt, 1921; A Textbook of European Archaeology, R. A. S. Macalister, 1921; Stone Age Africa, L. S. B. Leakey, 1936; The Prehistoric Foundation of Europe, C. F. C. Hawkes, 1940; From Savagery to Civilisation, G. Clarke, 1946.

Stonechat (*Saxicola torquata*). Small British bird, belonging to the thrush tribe. In the male the



Stonechat, often found on British commons

plumage of the head, back, wings, and tail is black and white, with a bright reddish breast; while the female has a dusky brown head and back, and a black throat speckled with white and

red. The bird is about 5 ins. long. See Eggs colour plate.

Stone Circle. Megalithic monument comprising a series of menhirs (*q.v.*) enclosing a round, oval, or rectangular area. In France it is called a cromlech (*q.v.*). The largest British example, at Avebury, Wilts, was a circle of 100 menhirs enclosing two pairs of concentric rings. Other examples are Long Meg and her Daughters, Cumberland; Dance Maen, Cornwall; Stanton Drew, Somerset. They are numerous in N. Africa; Syria; India; Malay Archipelago (Borneo, Celebes); the Pacific (Gilbert Islands); and Peru. See Stanton Drew.

Stone-crop (*Sedum*). Popular name for a number of hardy, creeping plants of the family Crassulaceae. See Sedum.

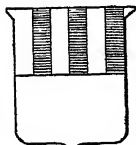
Stone Fly. Name given to sombre-coloured insects of the order Plecoptera (Gk. *plekein*, to fold; *pteron*, a wing), with narrow membranous fore wings and broader folded hind wings. They are rarely found far from water, in which their immature

or nymphal stages are spent. Some 32 species are British.

Stonehaven.

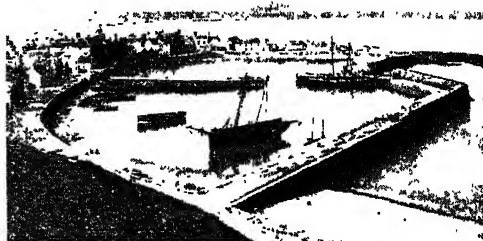
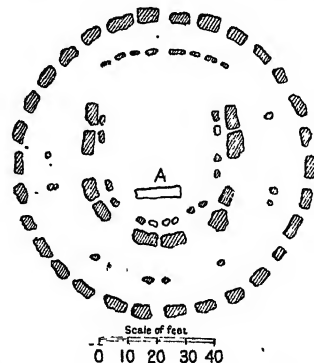
Police burgh, seaport, and the co. town of Kincardineshire, Scotland. It stands on the North Sea and the Carron and Cowie rivers, 15 m. S. by W. of Aberdeen, and is served by rly. There are an old

and a new town and a small harbour; also amenities for summer visitors. Pop. 4,250. See Dunnotar Castle.



Stonehaven burgh arms

Wilts, England. The most imposing megalithic structure in Great Britain, it comprised integrally two concentric stone rows on a horseshoe plan, surrounded by two concentric stone circles. Now much impaired, it stands within a circular earth-



Stonehaven, Kincardineshire. The bay and old town built round the fishing harbour

work, 300 ft. across, opening towards the N.E. into an embanked avenue still 200 ft. long. Within this stands the Friar's Heel, a sarsen menhir or tertiary sandstone, 16 ft. high; at the earthwork opening, the so-called slaughterstone, 20 ft. long, lies prostrate.

The outer circle, 100 ft. across, comprised 30 sarsen uprights, 16 ft. high, and 3½ ft. apart, each with two tenons atop, into which was mortised a continuously dovetailed architrave of horizontal capstones, 2 ft. 8 ins. high. Nine feet within, an inner circle of menhirs, 6 ft. high, were mostly diabase bluestones. Within this arose a horseshoe of five trilithons, each of three sarsens, the two single-tenoned uprights supporting an independent capstone. The innermost pair of uprights are 21½ ft. high, the capstone 15 ft. long, 3½ ft. high. An inner horseshoe of bluestone menhirs enclosed the so-called altar-stone (A) of micaceous sandstone, 16 ft. long.

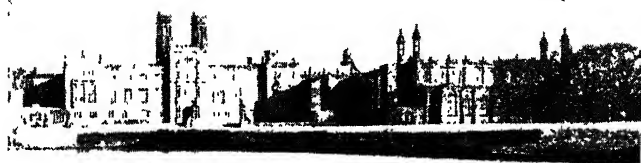
Of each series less than half remains standing, some being prostrate, some missing. The uprights, all embedded at varying depths in the chalk soil, were doubtless poised and imposed by means of earthen ramps and ropes. The sarsens, identical with the greywethers of Marlborough Downs, 14 m. away, were, after



Stonehenge. The ancient stone monument on Salisbury Plain, after its restoration in 1920, from the south-west. Top, plan, from the same point, showing original position of existing stones. A marks the Altar stone

rough dressing, transported thence by human labour. The igneous bluestones are erratic boulders, perhaps from a local ice-borne deposit, or brought from Pembrokeshire, 200 m. away. Sir J. N. Lockyer, regarding the monument as designed to mark the midsummer sun rising, calculated for it the date 1680 B.C.

On Dec. 31, 1900, one of the outer pairs with its capstone fell.



Stonyhurst College, Lancashire. South front of the public school, viewed from the lake. Founded at St. Omer, the school was moved to England in 1794

Restoration and concurrent excavations revealed many flint axes, with quartzite hammerstones up to 6 lb., and mauls up to 64 lb., besides antler picks. This evidence pointed to a late Neolithic date, anterior to metal tools. The earthwork was apparently of older date. The property was presented to the nation in 1918, and further excavations and restorations were carried out from 1920. See Trilithon; Woodhenge.

Bibliography. Stonehenge, W. M. F. Petrie, 1880; S. and its Earth Works, E. Barclay, 1895; Archaeologia, lxviii, W. Gowland, 1901; S. Astronomically Considered, Sir J. N. Lockyer, 1906.

Stonehouse. Parish and town of Lanarkshire, Scotland. It is 18 m. S.E. of Glasgow by rly., and has textile and coal mining industries. Pop. 3,704.

Stoneleigh. Parish and village of Warwickshire, England. It is on the Avon, about 2 m. E. of Kenilworth. Stoneleigh Abbey, the seat of Lord Leigh, dates from the early part of the 18th century, but embraces portions of a 12th century monastery founded by Henry II. These include a number of Norman doorways and the S. aisle and transept of the abbey church, and in the crypt are remains of a piscina and ambry. Its W. front is in the Classic style, and was built by the 3rd earl in 1720. It contains a fine collection of portraits and paintings by Lely, Wynants, Holbem, Gainsborough, and other celebrated artists.

Stone Money. Currency tokens formerly used by the Micronesian people of Yap, one of the Caroline

islands. The native name was fei. They were solid limestone disks, from 1 ft. to 12 ft. in diameter, with square holes for pole-transport. Small change was furnished by flat pearl shells, down to 5 ins. in diameter.

Stone Monuments. Term denoting a homogeneous class of prehistoric structures of unhewn or slightly worked stones. Often massive, they are preferably

termed megalithic (*g.v.*). While some arose in the Neolithic environment, they also pertain to early Bronze-age Europe. Their construction was continued through the early Iron age, and survives in India and elsewhere. See Beehive Structure; Cromlech; Dolmen; Druid Circle; Menhir; Monolith; Stone Circle; Stonehenge.

Stonesfield Slate. In geology, name given to a limestone of the Jurassic period. The stone is not really a slate, but is so called from the fact that it is thin bedded, and can be used for many purposes like true slate.

Stoneware. Class of earthenware glazed with salt. It was made in central Europe during the 16th century, and thence found its way to England, where it was first made at Fulham. According to legend, the process was a new discovery about 1652. On a farm in Staffordshire an earthen pot containing salt and water was being heated. Through neglect the pot boiled dry, and became red hot; when cool it was found to have become coated with a hard, fine glaze. See Pottery.

Stonor. Village of Oxfordshire, England. It is 14 m. N.W. of Henley-on-Thames. Stonor Park is the seat of Baron Camoys, the head of an old R.C. family, the peerage dating from 1264. In the house, the Jesuit Edmund Campion set up his printing press in the reign of Elizabeth. The upper part of Wren's original spire of S. Bride's, Fleet Street, London, stands in the grounds of Park Place. Here also is found Temple Coombe, a druidic temple found in Jersey and brought to Park Place in 1785. to

honour Gen. Conway, governor of the Channel Islands.

Stonyhurst College. R.C. public school. In Lancashire, about 4 m. N.W. of Whalley, it ranks as the chief school of its kind. It is the successor of a school founded at St. Omer about 1592 by the Jesuit, Robert Parsons. This was moved to Bruges in 1762, and to Liège in 1773. When the French Revolution drove it to England, a Lancashire squire gave his house at Stonyhurst for the school, and there it has been ever since 1794. The original buildings have been much extended, and in addition to the usual school building, laboratories, etc., it has a magnificent library and a museum. There is accommodation for about 400 boys, who are divided into the higher line and the lower line, and there is a preparatory school. The head is the rector, and most of the masters are priests.



Stonyhurst College arms

Stony Stratford. Town of Bucks, England. Formerly a market town, Stony Stratford stands on the Ouse and the Grand Union Canal, 8 m. N.E. of Buckingham and 2 m. from its rly. station, Wolverton. The churches of S. Mary Magdalene and S. Giles were rebuilt in the 18th century, but each incorporates some part of an earlier structure. An Eleanor cross erected here was pulled down in 1646. The industries include engineering works. Pop. 2,000

Stool (A.S. *stól*, seat). Small seat without a back. One of the first articles of furniture to be made, it is seen in a variety of forms in old Egyptian sculptures. It is usually a square or round block supported by three or four legs, and frequently upholstered. It varies in size from a foot-stool to a high seat. (See illus. p. 7808; also Faldstool; Furniture.)

The stool of repentance was a pew or seat in a Scottish church, elevated above the congregation, upon which those guilty of moral offences were made to stand. It disappeared from use before the end of the 18th century.

Stoolball. English game, regarded as the ancestor of cricket. A stool was placed on the ground and defended by a player with his hand, afterwards with a stick, against a ball tossed at it by his opponent. Every time the ball was hit away it counted one to the

batsman; if it hit the stool he was out. The game has been revived in some country districts of England.

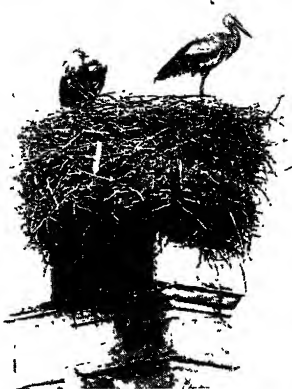
Stop. Act of stopping, a hindrance. In punctuation (*q.v.*), a full stop or full point marks the end of a sentence. A stop in music has several meanings. (1) In the organ, it means a complete set of pipes of the same quality and answering to the same control, *c.g.* an open diapason or an oboe. It is so called because, so long as the stop handle is not drawn, the way for the wind to flow into any of the pipes, when their respective keys are depressed, is stopped. When it is drawn out the way is open. (2) The harpsichord was often provided with stop handles, either above or at the side of the manuals. They affected the action so as to produce different tone effects, or to bring into play an octave string. (3) A string instrument player stops his strings by pressing the fingers upon them.

Stopes, MARIE CARMICHAEL (b. 1880). British eugenicist, palaeontologist, and writer. Born in Edinburgh, Oct. 15, 1880, she was educated at London and Munich universities, graduated Ph.D., and was the first woman placed on the science staff at Manchester



Marie Stopes,
British eugenicist

university, 1904. An expert on fossil plants, she went with a scientific mission to Japan in 1907, and later wrote standard books on plants of the ancient world. In England in 1918 she married the aircraft designer, H. V. Roe. With him she founded in 1921 a clinic for birth-control, and began a determined fight for liberty of expression on this topic which aroused strong opposition and involved her in several lawsuits. This pioneer in frank statement upon sexual



hygiene wrote widely read books with such titles as *Married Love*, 1918; *Radiant Motherhood*, 1920; *Contraception*, rev. ed. 1931; *Marriage in My Time*, 1935. Marie Stopes was also a novelist, playwright (Our Ostriches, Court Theatre, 1923), no mean lyric poet (*e.g.* The Bathe, 1946), and a eulogist of the verse of Lord Alfred Douglas. Under the pseudonym Erica Fay she wrote a children's play *Buckie's Bears*, produced at the Royalty, Dec. 7, 1931, and five subsequent Christmasmas.

Stop Order. In English law, means whereby any person having a claim to or lien on a fund in court, or on stocks or shares standing to the credit of any cause in the name of the paymaster-general, may obtain an order stopping the fund being paid out, or the stocks or shares transferred to anybody, without notice to him.

Stop Watch. Watch indicating fractions of a second by a hand that may be stopped instantly by pressure on a spring or catch. It is used in timing races, to record an interval between two successive observations, or to mark the exact time of an observation without looking away from the object observed. *See* Watch.

Stork. Family of large birds (*Ciconiidae*) belonging to the heron

group, but distinguished by many minor features of structure. They have long, straight, and sharp beaks, and long legs. The white stork (*Ciconia ciconia*) is common in Central Europe, but occurs very occasionally in the E. counties of England. The plumage is white, with the exception of some black feathers on the wings; the beak



Stork. White stork, common in Central Europe, where it builds its nest on the chimney tops, as shown at top

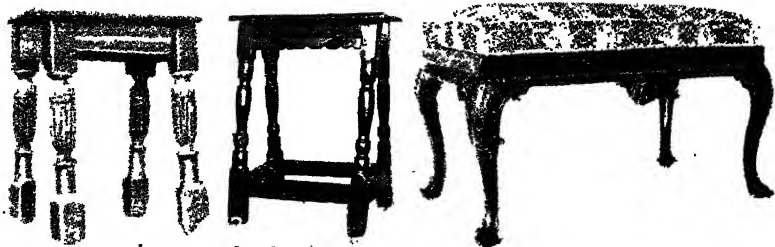
and legs are red; and the total length is about 43 ins. The species is migratory, the winter being passed in Africa, where it ranges from Algeria to Cape Colony.

This stork usually builds its nest on a house roof or church tower. The same nest is used year after year, more sticks being added each season till it often reaches a great size. The food consists of reptiles, small mammals, insects, and offal; and the bird, thus useful as a scavenger, is more or less protected in Holland and Germany.

The black stork (*C. nigra*) is smaller and much less common; but is widely distributed in Central and S. Europe, in Asia, and in some parts of Africa. It occasionally occurs as a straggler in Great Britain, and is found chiefly in

swamps, where it nests in the trees. *See* Adjutant; Jabiru; Marabou.

Stork's-bill (*Erodium cicutarium*). Annual or biennial herb of the family Geraniaceae. It is a native of Europe, W. Asia, and N. Africa. It has oblong leaves divided into many acutely lobed



Stool. 1. Carved oak, late 16th century. 2. Oak, c. 1650. 3. Walnut with woolwork cover, early 18th century. *See* text in p. 7807

By courtesy of the Director, Victoria and Albert Museum

segments. The rosy flowers are clustered in small umbels. The long tapering fruits, when ripe, split into five segments lined with hairs, each segment forming a tail to a seed. The tail coils into a spiral and the hairs stand out laterally. When the seed falls to the ground the alternate lengthening and shortening of the spiral, under the influence of the dryness and moisture of the atmosphere, forces it into the earth.

Storm. Term commonly used for any violent disturbance of the atmosphere. High winds or gales, included under the headings of storms, occur suddenly at irregular intervals. Storms are of three main classes. First there are the depressions of extra-tropical latitudes. These are great eddies of the prevailing westerlies, whose diameters range from 500 to 1,000 m. or more. Such storms occur in both hemispheres in the latitudes of the westerlies, and are accompanied by changeable winds, great masses of cloud, and much rain or snow. To the second class of storms belong the violent tropical cyclones, hurricanes, and typhoons. These are accompanied by dense masses of clouds and torrential rains. In the third class may be put tornadoes, water-spouts, and thunderstorms and squalls. See Cyclone; Depression; Hurricane; Squall.

Storm, THEODOR WOLDSSEN (1817-88). German poet and novelist. He was born at Husum, Slesvig, studied jurisprudence at Kiel and Berlin, and became a judge. He died July 3, 1888. A prolific writer of poems and stories, he is best known by *Immensee*, 1850; *Gedichte* (Poems), 1852; *Psyche*, 1875; *Bei Kleinen Leuten* (Among Little People), 1887.

Stormont. Site of the parliament buildings of N. Ireland in Belfast. The former estate of Stormont Castle is to the E. of the city on the Newtownards road; it was purchased in 1921 by the government, and the foundation stone of the new buildings was laid in 1928. The U.K. parliament contributed the cost of approximately £500,000. There are chambers for the senate and lower house, and 157 other rooms. In the drive stands a large statue of Carson. See illus. p. 1051.

Stormovik. Russian military aircraft. It was developed during the Second Great War for low level attack against German armoured units. A single-seater machine with a wing span of 32 ft., it was armoured against light A.A. fire and mounted a 37-mm. cannon and, in later versions, six rocket guns.

It had a top speed of 260 m.p.h. and exceptional manoeuvrability at low levels.

Storm Trooper. Member of the *Sturm-Abteilung*, the former Nazi party army in Germany. Organized in 1922 ostensibly for the protection of speakers at party meetings, the storm troopers were in fact intended as the army of a Nazi revolution. They were tolerated by the authorities as one of the many substitutes for the army forbidden by the Versailles treaty. The distinguishing uniform of the organization was a brown shirt. When Hitler came to power in 1933, it assumed an official character, but lost much of its influence after the purge of 1934, when its paramount position was taken by the S.S. troops. In 1936 the storm troops were reorganized to provide pre-military training on a spare-time basis. The movement had a maximum strength of 2,000,000 men. Besides enforcing the anti-Jewish laws, it furnished guards at concentration camps. Put on trial at the Nuremberg tribunal in 1945-46, it was acquitted.

Stornoway. Seaport and police burgh of Lewis, Scotland. Standing on a large modern harbour on the E. side of the island, it is 180 m. N.N.W. of Oban and is the chief town of the Outer Hebrides. The castle, in Tudor style, is used as municipal buildings. Stornoway is a centre of the herring fishery. Founded by James VI, it is the biggest town in Ross-shire, with pop. 3,771, and was the birthplace of the explorer Mackenzie.

Storrs, SIR RONALD (b. 1881). British administrator. Born Nov. 19, 1881, he was educated at



Sir Ronald Storrs, British administrator

Charterhouse and Pembroke College, Cambridge. He worked for the Egyptian government from 1904 and in 1909 became Oriental secretary to the British agency at Cairo. Assistant political officer to the Anglo-French mission, 1917, and liaison officer for the mission in Bagdad and Iraq, he performed valuable work, and was made military governor of Jerusalem, 1917-20, civil governor, 1920-26. Having governed Cyprus for the next six years and N. Rhodesia for two, Sir Ronald in 1934 retired from tropical service. He was special correspondent for the *Sunday Times* in 1942-43, lec-

tured for the British Council, broadcast on foreign affairs, and wrote commentaries on the Second Great War. He was knighted in 1924. His autobiographical *Orientations*, 1937, was republished in final definitive ed. 1945.

Storting (great council). Name of the legislative body of Norway (*q.v.*). It consists of 150 members chosen by universal suffrage every fourth year.

Story, JOHN (c. 1510-71). English martyr. An M.P. in 1547, he came into prominence by his opposition to the Act of Uniformity in 1548. He was made chancellor of the dioceses of London and Oxford, and dean of arches in 1553. A vigorous heretic-hunter under Queen Mary, he was arrested in 1563, during Elizabeth's reign, but escaped to Flanders. Decey to England in 1570, he was executed at Tyburn, for high treason, June 1, 1571. He was beatified by the R.C. Church in 1886.

Story, JOSEPH (1779-1845). American jurist. Born at Marblehead, Massachusetts, Sept. 18, 1779, and educated at Harvard College, he was elected to the state legislature, 1805, and to congress, 1808. Associate justice to the supreme court, 1811-45, he died Sept. 10, 1845. He wrote *Commentaries on the Constitution of the United States*, 1833.



Joseph Story, American jurist

Story, SHORT. The development of this branch of fiction is described under Short Story.

Story of an African Farm, THE. Novel by Olive Schreiner (*q.v.*), published, under the pseudonym of Ralph Iron, in 1883. It is remarkable for its vivid descriptions of life on a South African ostrich farm, its striking presentation of the problems troubling a strong intelligence in restricted circumstances, and its deep pathos.

Story of San Michele, THE. Autobiography of Axel Munthe (*q.v.*). This vol. of memoirs was published in 1929, and takes its title from the author's villa on Capri where the book was written. The book was one of the most widely read autobiographies of its time.

Stössel, ANATOLY MIKHAILOVITCH (1848-1915). Russian soldier. Entering the army in 1866, he became a general in 1899. During the Russo-Japanese War, 1904-05, he was in command of the fortress of Port Arthur, and during the

progress of the siege was given credit by the outside world for what appeared to be a most heroic defence. When the fortress fell, however, the matter took a different complexion, and in 1908 he was tried by court-martial and sentenced to death. The sentence was commuted to ten years' imprisonment, but after fifteen months he was released because of ill-health. He died Jan. 17, 1915.

Stothard, THOMAS (1755-1834). British artist. Born in London, Aug. 17, 1755, he studied at the



Thomas Stothard,
British artist
After J. Jackson

R.A. schools. He painted subject pictures in oils, particularly for Boydell's Shakespeare Gallery, but his real talent lay in illustrative design. Richardson's novels, and

many other classics, were illustrated by him, with drawings of character and grace. More than 3,000 of these drawings were published. He became A.R.A. in 1791, R.A. in 1794, and librarian in 1812. He died in London, April 27, 1834. See Portland, 3rd Duke of.

Stott, THOMAS (1755-1829). Irish poet. Born at Hillsborough, co. Down, April 21, 1755, he developed a facility for verse at an early age. Settling at Dromore, co. Down, he made a considerable fortune in the linen-bleaching business. His early poems, published in various local organs, and usually signed Hafiz, evinced decided republican views. His opinions became more conservative with advancing years. He is chiefly remembered for The Songs of Deardra, 1825. Died April 22, 1829.

Stott, WILLIAM (1858-1900). British artist. Born at Oldham, he



Thomas Stott,
Irish poet
From a painting of
c. 1800

studied under Gérôme in Paris, and for some time resided in France, chiefly near Fontainebleau. Ultimately he settled in London, where his imaginative figure-

subjects attracted great attention. He was also a good painter of landscape, especially mountains, and a portraitist. Stott of Oldham, as he was called, died suddenly at sea, Feb. 25, 1900.

Stoughton, JOHN (1807-97). British divine. Born at Norwich, Nov. 18, 1807, he was educated



John Stoughton,
British divine

at the grammar school there. Having abandoned the career of a lawyer, he was trained at Highbury for the Congregational ministry and became, in 1833, minister of a church at Windsor. In 1843 he moved to Kensington, and remained there until 1875. In 1856 he was chairman of the Congregational Union, and from 1872 to 1884 was professor at New College, Hampstead. Also known as an historian, he wrote Ecclesiastical History of England, 1867-70, and other works. Stoughton died Oct. 24, 1897. His eldest son, Thomas Wilberforce Stoughton (1842-1917), founded with M. H. Hodder the publishing firm of Hodder & Stoughton (q.v.). Consult Recollections of a Long Life, J. Stoughton, 1894.

Stour. Name of several English rivers. One is in Kent; rising to the N. of Hythe, it flows N.W. to Ashford and then N.E. past Canterbury to Stourmouth, where it receives the Little Stour, and, after a further winding course, enters Pegwell Bay by an estuary at Sandwich. Its length is 40 m.

Another Stour rises in several headstreams which unite near Haveringham, whence it passes E. between Essex and Suffolk to the N. Sea at Harwich. Its length is 47 m., and it is navigable to Sudbury.

A third river of this name rises 5 m. S.W. of Banbury, Oxon, and flows W. and N.W. to the Avon, near Stratford-on-Avon. Its length is 20 m. Yet another Stour rises near the S.E. boundary of Somerset and flows 55 m. S.E. through Dorset and Hants to the Avon at Christchurch.

A fifth river rises near Halesowen and flows W. past Stourbridge into Staffs, and then S. through Worcestershire, joining the Severn at Stourport. It is 20 m. long.

Stourbridge. Mun. borough and market town of Worcestershire, England. It stands on the Stour, 144 m. N.W. of London and 12 m.

W. of Birmingham, and is served by rly. and canal. The buildings include S. Thomas's church, S. Mary's church, town hall, endowed school, corn exchange, and market house. The town is noted for its fine clay, which is made into firebricks, and also for its glass, the latter industry having been introduced about 1600 by refugees from Hungary. Hardware and leather are manufactured, and around are coal mines. At Kinver Edge, 4 m. away, is a stretch of moorland used as a public park. The old name of Stourbridge was Storebrugge. From 1888 to 1914, when it was made a borough, it was an urban dist., and before then was in the parish of Old Swinford. In



Stourbridge, Worcs. View showing
the town hall and Market Street

1933 the urban district of Lyo and Wollescote and the parish of Pedmore in Bromsgrove rural district were added to the borough. Pop. 36,290.

Stourbridge (OR STURBRIDGE) **Fair.** Fair held at Barnwell, Cambridge, and for long perhaps the most important in England. It probably began in the 12th century, and the earliest known charter for it was given early in the 13th. Held in Oct. and Nov., it was opened by the vice-chancellor, and the university had certain rights over it. The main articles sold were cheese, wool, timber, and horses. Defoe described it in his Tour through Great Britain, 1724-26. The name is that of a chapelry, 1 m. N.E. of Cambridge proper. It had a hospital for lepers, of which the chapel, a Norman building, remains.

Stourport. Urban dist. and market town of Worcestershire, England. It stands at the junction of the Stour and Severn, and is the terminus of the Staffordshire and Worcestershire canal, being 4 m. S.W. of Kidderminster and 12 m. N. of Worcester by rly. It has



William Stott,
British artist

manufactures of carpet and iron ware and a trade along the river and canal. There are petrol storage depots and a large electrical generating station. Stourport owes its existence to the opening of the canal about 1780. Market day, Sat. Pop. 9,500.

Stout. Details of the manufacture of this malt liquor are given under Brewing.

Stove. Primarily a fuel-burning apparatus for warming and/or cooking, built so as to be independent of brickwork. Several patterns are specifically designed to burn special fuels, such as anthracite and lignite, and others trade wastes such as sawdust. In the simplest form a closed-top cylinder of cast iron is provided with a primary air inlet at floor level immediately below a fire-bar grating, and with a smoke-pipe connexion near the top. This pattern heats largely by radiation, and may be opened only to replenish the fire. Others may remain open when in use, and these are often fitted with a perforated casing that greatly assists convection heating. In all patterns the rate of combustion is controllable by altering the size of the primary air opening.

Stoves are widely used in rural areas, and usually incorporate a top or back oven. In urban areas a coloured enamel casing of a stove may conceal a hot water boiler serving several radiators in addition to tap water. Solid-fuel heating and cooking stoves have been largely superseded by gas, electric, and oil burning units, and by heavily insulated heat storage cookers. These are often fitted with thermostatic controls.

Stove House. In horticulture, a structure for the rearing of plants which require the steady maintenance of a high temperature. The temperature should range from a minimum of 60° up to at least 80° F., the winter day maximum being 70° and the summer day minimum 65°. The heat is usually supplied by hot-water pipes, and, to prevent dryness of atmosphere, shallow iron pans filled with water should be stood

upon the pipes at intervals. Over some of the pans plants requiring rapid forcing can be placed in receptacles filled with coconut refuse, tan, etc., the shallow tanks providing the necessary bottom heat. *See* Greenhouse; Hothouse.

Stow, JOHN (c. 1525-1605). English antiquary. Born in London, son of Thomas Stow, tallow chandler, he became



John Stow,
English antiquary
From a print by
G. Vertue

a tailor at Aldgate, took his brother Thomas as apprentice, but from about 1560 devoted himself to antiquarian research. A great book collector, he was reported to the authorities in 1569 as possessing 38 dangerous works of superstition or "papistyry." Straited in circumstances in his later life, but honoured, notably by Archbishop Parker, for his industry and learning, James I granted him patents in 1603 and 1604 to ask and take benevolence. He died of stone colic, and was buried, April 8, 1605, in the church of S. Andrew Undershaft, where a monument was erected to him.

Stow's works include notable summaries of old English chronicles, but he is chiefly remembered for his valuable Survey of London, 1598 and 1603, the chief authority on the city as it was in his own time. The Survey was edited and enlarged in 1618, 1633, 1720, and 1754. *Consult* Edition of the original text, with Life and Notes, C. L. Kingsford, 2 vols., 1908.

Stowe. Historic mansion, now the home of a public school, 3 m. N. of Buckingham, England. Over 900 ft. in length, with superbly decorated rooms, richly appointed and surrounded by vast grounds abounding in temples and statuary, it was mainly built by Sir Richard Temple about 1660, added to by his successors, and was the seat of the dukes of Buckingham and Chandos until 1889, when it passed to the 3rd duke's daughter, the baroness Kinloss, by whose order

it was sold in 1921. It was opened as a public school in 1923, and in 1928 Queen Mary laid the foundation stone of the school chapel, built to designs by Sir R. Lorimer. The original building was the nucleus of the school, which grew rapidly, holding eventually some 500 boys. The Stowe MSS., bought by the marquess of Buckingham in 1803, were acquired by the British Museum in 1883.

Stowe, HARRIET ELIZABETH BEECHER (1811-96). American writer and abolitionist. Born in

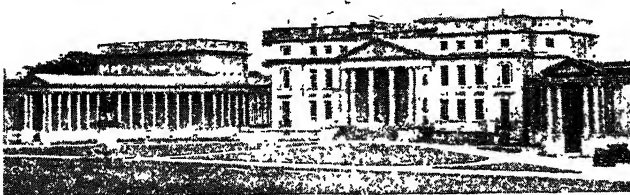
Litchfield, Conn., June 14, 1811, the daughter of Lyman Beecher (q.v.), the preacher, and the sister of Henry Ward Beecher (q.v.).



Harriet Beecher Stowe
she was educated at Litchfield Academy and at Hartford. She accompanied her father to Cincinnati in 1832, and in 1836 married one of his assistants, the Rev. Calvin E. Stowe, a strong anti-slavery advocate.

She had no personal experience of slave-owning society; but the novel *Uncle Tom's Cabin*, which made her name, helped materially in the abolition of slavery in the U.S.A. It appeared as a serial in *The National Era*, of Washington, between June, 1851, and April, 1852, and was published in book form in Boston in 1852. Mrs. Stowe visited Europe in 1853, when she spoke in favour of emancipation of the slaves, and in 1856 pressed it anew in *Dred: a Tale of the Dismal Swamp*. In 1869 Mrs. Stowe stirred up a bitter controversy in England by her article on Lord and Lady Byron, in *Macmillan's Magazine*, and by publishing in *Lady Byron Vindicated* the nature of the charges brought against the poet by his wife. She died at Hartford, Conn., July 1, 1896. *Consult* Lives, by her son, 1889; C. Gilbertson, 1937; Crusader in Crinoline, F. Wilson, 1942.

Stowell, WILLIAM SCOTT, BARON (1745-1836). British lawyer. Born at Heworth, Durham, Oct. 17, 1745, he was educated at Newcastle grammar school and Corpus Christi College, Oxford. He became Camden lecturer on ancient history at Oxford and a barrister, and in 1780 began to practise in London. In 1788 he was made a judge, and during 1798-1827 was



Stowe, Buckinghamshire. North front of the mansion, now a public school



Baron Stowell,
British lawyer
After T. Phillips

judge of the court of admiralty. Having sat in the house of commons for Oxford university, he was made a baron in 1821. He died Jan. 28, 1836. Stowell

is regarded as the founder of British prize law and one of the great authorities on international law.

Stowmarket. Market town and urban dist. of Suffolk, England. It stands on the Gipping, 12 m. N.W. of Ipswich and has a rly. station. The chief buildings are the old church of SS. Peter and Mary and the corn exchange. The old vicarage has associations with Milton. There are manufactures of chemicals and agricultural implements, and a trade in corn. Market day, Thurs. Pop. 7,500.

Stow-on-the-Wold. Market town of Gloucestershire, England. It stands on the Fosse Way, at an



Stow-on-the-Wold, Gloucestershire. View of this market town in the heart of the Cotswolds

alt. of 765 ft., 18 m. E.N.E. of Cheltenham, with a rly. station. There is an old church and in the market place a 14th century cross. Horse and cattle fairs are held. Pop. 1,800.

Strabane. Market town and urban dist. of Tyrone, N. Ireland. It stands on the Mourne, near where it joins the Finn to form the Foyle, 14 m. S.S.W. of Londonderry and 161 m. N.W. of Dublin, with both of which places it has rly. connexion. Industries include iron foundries and shirt and underwear factories, and there is a trade in agricultural produce. Across the river, which here constitutes the boundary with Eire, is Lifford. Strabane had a castle in the 16th century and sent two members to the Irish parliament until 1800. A canal connects it with the Foyle. Market days, Tues. and Sat. Pop. 5,600. *Pron.* Str**ˈ**bann.

Strabismus (Lat. *strabus*, squinting). Medical term for the defect of the eyes known as squinting (*q.v.*).

Strabo (c. 63 B.C.-A.D. 19). Greek geographer. Born in Amasia, Pontus, he travelled extensively, and in 29 B.C. settled in Rome, where he lived until his death 47 years later. He was the author of two important works: (1) *Historical Memoirs*, in 46 books, a continuation of Polybius from 146 B.C. to the death of Caesar, lost with the exception of some fragments; (2) *Geographica*, in 17 books, nearly all preserved. It is a valuable work, partly based upon his personal experiences, and, after that of Ptolemy, is the chief authority on ancient geography. Books 3-10 are devoted to Europe, 11-16 to Asia, and 17 to Africa.

Strabolgi, JOSEPH MONTAGUE KENWORTHY, 10TH BARON (b. 1886). British sailor and politician. Born March 7, 1886, he was educated at the R.N. Academy, Winchester, and in H.M.S. Britannia, entering the Royal Navy, 1902. He served in the First Great War, became lieutenant-commander, 1916, and retired, 1920. He entered politics, and was Liberal M.P. for Central Hull, 1919, transferring his allegiance to the Labour party, 1926, and losing his seat in the general election of 1931. Commander Kenworthy succeeded his father

as 10th baron, 1934, and was opposition chief whip, house of lords, 1938-42. As a politician he established a reputation as an indefatigable questioner of ministers. His many publications, chiefly on naval matters, included *Statesmen and Others* (autobiography), 1933; *The Battle of the R. Plate*, 1940; *Singapore and After*, 1942; *Sea Power in the Second Great War*, 1943; *Conquest of Italy*, 1944.

Strachey, (EVELYN) JOHN (ST. LOE) (b. 1901). British politician and writer. Son of John St. Loe Strachey (*q.v.*), he was born Oct. 21, 1901, and educated at Eton and Magdalen College, Oxford.



Lord Strabolgi,
British politician

He was Labour M.P. for Aston from 1929 to 1931, when he resigned from the Labour party, joining for a short time Sir O. Mosley's New party.

In 1945, having rejoined the Labour party, he became M.P. for Dundee (Dundee W. from 1950). He was under-secretary for air until 1946, then minister of food. In 1950 he became secretary for war. He wrote *The Coming Struggle for Power*, 1932; *The Menace of Fascism*, 1933; *The Nature of the Capitalist Crisis*, 1935; *The Theory and Practice of Socialism*, 1936; *A Programme of Progress*, 1939; *Post D (A.R.P. Experiences)*, 1941. During the Second Great War, as Sqn. Ldr. Strachey, he became widely known as a broadcaster.

Strachey, (GILES) LYTTON (1880-1932). British writer. A son of Sir Richard Strachey (*q.v.*), he was born March 1, 1880, and educated at Trinity College, Cambridge, where he first turned to the study of history. His first book was *Landmarks of French Literature*, 1912; but it was a volume of biographical essays, *Eminent Victorians*, 1918, which brought him prominence. Queen Victoria, which followed in 1921, aroused wide controversy. Later he wrote critical studies of Pope, Voltaire, and others, as well as *Elizabeth and Essex*, 1928, which was a lively picture of a completely different type. He died Jan. 21, 1932. Strachey may be regarded as the founder of a new school of biographical writing, which was in reaction against the uncritical adulation of most official biographies. He had a malicious wit and a brilliant sense of satire. An estimate of his work by Max Beerbohm appeared in 1943.

Strachey, JOHN ST. LOE (1860-1927). British journalist. Second son of Sir Edward Strachey, 3rd Bart., he was educated at Balliol College, Oxford. He edited *The Cornhill Magazine*, 1896-97, when he became editor and proprietor of *The Spectator* (*q.v.*). He was a strong defender of free trade,



John Strachey,
British politician



Lytton Strachey,
British writer

while another cause he had at heart was the maintenance of good relations between England and America. His many books included *The Manufacture of Paupers*, 1907; *Problems and Perils of Socialism*, 1908; *Practical Wisdom of the Bible*, 1908. He died Aug. 26, 1927.

Strachey, Sir RICHARD (1817-1908). Anglo-Indian administrator. Born at Sutton Court, Somerset,



Sir R. Strachey,
Anglo-Indian
administrator

July 24, 1817, he entered the service of the E. India company in 1834. In 1846 he served with distinction against the Sikhs, and afterwards explored in the Himalayas, paying special attention to botany and geology. In 1856 he became a secretary in the Indian public works department, of which he was made head in 1862. He did valuable work in developing rlys. and irrigation. With his brother John he wrote *The Finances and Public Works of India*, 1882. In 1897 he was made a G.C.S.I. He died Feb. 12, 1908.

Stradivari, ANTONIO (c. 1644-1737). Italian violin maker. Born at Cremona, and apprenticed to Nicholas Amati, he at first modelled his instruments on those of his master, but about 1694 he adopted larger proportions, and became more independent in his methods. For a long time he seems to have experimented, but from about 1700 his instruments show that he had arrived at a definite conclusion as to the true proportions of a fine violin.

Upon the instruments of his maturest period rests his fame as indubitably the greatest of all violin makers. In the course of his long life, Stradivari made well over a thousand instruments, including violas and violoncellos, many of which are still extant, and the most celebrated of which are distinguished by particular names, such as *Le Messie*, *La Pucelle*, the *Dolphin*, etc. They are so much valued that large sums are paid whenever a "Strad" comes into the market. The finest specimens possess a rich full tone, but not all



J. St. Loe Strachey,
British journalist
Russell

his work is equally good, some of his early instruments in particular suffering from the use of inferior material at a time when he could not afford to buy better. On his labels Stradivari adopted the usual custom, and Latinised his name as Antonius Stradivarius. He died Dec. 18, 1737. See *Violin*; consult also *Stradivari: His Life and Work*, W. H. and A. F. Hill, 1902.

Strafford, EARL OF. British title borne by the families of Wentworth and Byng. The title was created in 1639 for Thomas Wentworth, the statesman, and became extinct when his son died in 1695. It was revived in 1711 for another Thomas Wentworth, Lord Raby, who was British minister at The Hague, 1711-14, and represented his country at the Congress of Utrecht. It remained with his descendants until the 5th earl died without sons in 1799. In 1847 Sir John Byng was made earl of Strafford, having been a baron since 1835. He was a great-nephew through his mother of the 4th earl, and was a military commander through the Peninsular War and at Waterloo. His descendants still hold the title, Edmund Henry Byng (b. Jan. 27, 1862) succeeding as 6th earl in 1918. The family seat is Wrotham Park, Barnet, and the earl's eldest son is known as Viscount Enfield.

Strafford, THOMAS WENTWORTH, EARL OF (1593-1641). English statesman. Born in London, April 13, 1593, of a great Yorkshire family, he was educated at St. John's College, Cambridge. He sat in successive parliaments under James I, and was the most powerful leader of the parliamentary opposition to Charles I and to

Buckingham. The critical year of his career was 1628, when he was active in promoting the *Petition of Right*, but on desiring to modify it was supplanted by Eliot as leader of the opposition. Wentworth passed over to the king's side and was created viscount.

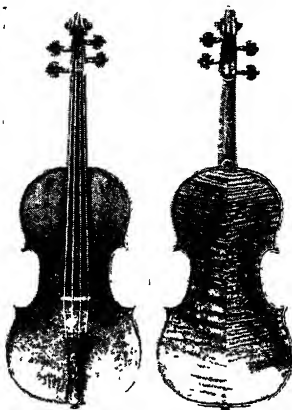
As president of the council of the north he exercised an arbitrary jurisdiction until in 1633 he transferred his energies to Ireland as deputy. Governing ruthlessly, with a strong hand and a clear head, and showing neither fear nor favour except where the interests of the crown were concerned, he brought Ireland such order as it had never before known. He used his deputyship to organize a military force which should be at the disposal of the crown.

By the intrigues of the queen and a clique of courtiers Wentworth's plans were repeatedly subverted. In 1639 he was created earl of Strafford, and vainly imagined that he had won over the king, but again Charles allowed himself to be led by the court party. The Long Parliament was summoned, and its first step (Nov., 1640) was to move for the arrest and impeachment of Strafford for high treason. Though he had urged the king to use his Irish troops against the warring Scots, this was obviously a fantastic charge. It was clear that on the evidence there was no possibility of procuring a verdict against Strafford, so the commons adopted the unprecedented course of passing a bill of attainder, condemning him to death. The bill required the royal assent, and in spite of his pledged word the king gave way. "Put not your trust in princes," exclaimed the great administrator, who on May 12, 1641, was beheaded on Tower Hill. "Black Tom the tyrant" died because he stood in the way of English constitutional development. Browning wrote a tragedy in verse on his last phase. Consult *Lives*, H. D. Traill, new ed. 1902; Lady Burghclere, 1931; C. V. Wedgwood, 1935; 2nd earl of Birkenhead, 1938; Strafford and Ireland, H. O'Grady, 1923.

Strahan. Seaport of Tasmania, on Macquarie Harbour, in Montagu co. The outlet for the Mt. Lyell copper mine, it has rly. com-



Strafford



Stradivari. Front and back of the
Alard Stradivari, dated 1715
By courtesy of W. D. Hill & Sons

munication with Burnie, on the N. coast of the island, and steamer service for Melbourne and Launceston. Pop. 800.

Strahlegg Pass. Alpine pass in Switzerland, in the Bernese Oberland. It connects the Grindelwald with the Grimsel Pass (*q.v.*) and reaches a height of 10,995 ft.

Straight, WHITNEY WILLARD (b. 1912). British administrator. Son of an American father, and of the future Mrs. D. W. Elmhirst, organizer of Dartington Hall, he was born Nov. 6, 1912, and educated at Lincoln school, U.S.A., Dartington Hall, and Trinity College, Cambridge. As a professional racing motorist he won international events and set up speed records. In 1934 he went into civil aviation, and during the Second Great War served in the A.A.F. and was an air A.D.C. to the king. He became managing director, 1947, and deputy chairman, 1949, of B.O.A.C.

Strain and Stress. Terms used in mechanics. Stress is the equal and opposite action and reaction which take place between two bodies, or two parts of the same body, transmitting force. In the first case it is called an external stress, and in the second an internal stress. The external forces, acting on any portion of a body in equilibrium, are balanced by the internal stress. A body is altered in shape or dimensions by the stress acting on it, and is said to be in a state of strain or to be strained.

There are three principal kinds of stresses: (1) tensile, (2) compressive, (3) shear, with three resulting strains: (1) extension, (2) contraction, (3) a side or shear. A rope being pulled is an example of a body in a state of tensile stress; a walking-stick being leant upon, of compressive stress; and a wire subjected to a simple twist, of shear stress. To subject a body to a uniform compression in all directions would require it to be immersed in a liquid medium itself under pressure. Stress is measured by the force exerted per unit area, *e.g.* dynes per sq. cm., or ft. lb. per sq. in. Strain is measured according to the type of deformation, *e.g.* as a change of length per unit length for a tensile strain or a change of volume per unit volume for a bulk strain. Hooke's law, first enunciated in 1676, is assumed to hold for small strains, and stated that stress is proportional to strain. The ratio $\frac{\text{stress}}{\text{strain}}$ is a constant for a given material and defines the modulus of elasticity (*q.v.*).

Strait. A narrow passage of water between two oceans or seas. Most straits have been formed by the sinking of the land, *e.g.* those of Menai, Dover, and Gibraltar.

Straits Settlements. Former British crown colony. It comprised Singapore, Malacca, and Penang, all adjacent to the Strait of Malacca. the Cocos Is., Christmas I., and Labuan. In 1946 the colony was abolished: Singapore, with Christmas I. and the Cocos Is., became a separate colony; Penang and Malacca became part of the union (later federation) of Malaya; Labuan became part of N. Borneo. See Borneo, British North; Malaya, Federation of; Singapore.

Stralsund. Dist. and seaport of Mecklenburg, E. Germany. The port is 80 m. E. of Lübeck, on an island in the Strelasund, an arm of the Baltic. Its suburbs are on the mainland. It was a rly. centre, and terminus of a ferry to Sweden. Interesting buildings were the churches of S. Nicholas (1276), S. Mary (1298), and S. James (1303), and the 13th century town hall, all damaged by bombs in the Second Great War. Industries included engineering, shipbuilding, and making chemicals and sugar.

Known as a town since 1234, Stralsund was a member of the Hanseatic League from 1278. From 1648 to 1807 it was under Swedish domination, and in 1815 it became Prussian, being made into a powerful fortress. The town's hero is Ferdinand von Schill, who in 1809 lost his life in trying to raise the populace against Napoleon. Captured May 1, 1945, by Rokossovsky's 2nd

White Russian army, it came within the Russian zone of occupation. Pop. (1935) 44,539.

Stramonium. In medicine, name given to the seeds and dried leaves of *Datura stramonium*, or the thorn apple. Its principal constituent is the alkaloid hyoscyamine, and it is given to relieve spasm in asthma.

Strand, THE. A London thoroughfare which runs W. from Temple Bar to Charing Cross. On island sites where the roadway divides are two old churches, both damaged by bombs in the Second Great War—S. Clement Danes, built by Wren, 1681, with tower by Gibbs, 1719, which was almost entirely destroyed; and S. Mary-le-Strand, by Gibbs, 1717, replacing a church of the same name of which Becket was rector, and near the site of the famous maypole, removed 1718. On the N. side is the front of the law courts, Gladstone statue, Australia House, Bush House South, the disused Gaiety Theatre, Strand Palace Hotel (on the site of Exeter Hall, *q.v.*), Vaudeville and Adelphi Theatres, Coutts's Bank, and offices of the govts. of Queensland, New Zealand, S. Rhodesia, and Tasmania, and Trafalgar Square tube station. On the S. are Aldwych tube station, King's College, Somerset House, the approach to Waterloo Bridge, Western Australia govt. office, Savoy Hotel and Theatre, Shell-Mex House, Tivoli cinema (built on the site of the former Tivoli music-hall), New South Wales govt. office, Halifax House, and Charing Cross rly. station and Strand tube station.



The Strand. Western section of this famous London thoroughfare that connects the City with Westminster, looking E.



Strand-on-the-Green, Chiswick. Picturesque Georgian houses on the Causeway, overlooking the R. Thames

In early times little more than a bank of the Thames, hence its name, the Strand was long the sole land route from the City to Westminster, was crossed by several bridges, was not effectively paved until the time of George III, and has undergone many changes since, though it remains one of the busiest London thoroughfares. To its first building of note, the Savoy palace, were added ecclesiastical inns and mansions of great nobles, recalled by local names. See *Adelphi*; *Aldwych*; *Holywell Street*; *King's College*; consult also *Annals of the Strand*. E. B. Chancellor, 1912.

Strandlooper (Dutch, shore runner). Prehistoric cave-dweller on the W. coast of S. Africa. Human remains and handiwork show the tribe to have been short and round-headed, apparently immigrant from N. Africa. See *Bushman*.

Strand Magazine, THE. British illustrated monthly. Published in London it was founded, Jan., 1891, by Sir George Newnes, with H. Greenhough Smith as editor. Giving high-class fiction and illustrated articles, it proved an instant success. Many famous writers were closely associated with the magazine during the first thirty years of its existence, e.g. Sir A. Conan Doyle, most of whose Sherlock Holmes stories first appeared in it, W. W. Jacobs, P. G. Wodehouse, and E. Nesbit; and among others who contributed serial stories were H. G. Wells, F. Anstey, Rudyard Kipling, Hall Caine. During the Second Great War the Strand appeared in pocket size. It ceased publication with its issue of March, 1950.

Strand-on-the-Green. Formerly a hamlet of Middlesex, now part of the bor. of Brentford and Chiswick. Strand-on-the-Green is a small district and gives its name to a road extending to Kew

Bridge; it is built along the N. bank of the Thames, opposite Olive Island, and was in earlier times a fishing village. The houses facing the river along the Causeway are notable examples of Georgian architecture. In the house named after him, Zoffany painted many of his "conversation pieces."

Strand Theatre. London playhouse, in Aldwych, W.C.2. It was opened as The Waldorf, May 23, 1905, under the management of the Schubert brothers, the first production being a revival of The Second Mrs. Tanqueray, in which Duse played the lead. Renamed The Strand in 1909, it staged many highly successful plays of varied types, e.g. Mr. Wu, 1913; Anna Christie, 1923; 1066 And All That, 1935; Judgement Day, 1937; Arsenic and Old Lace, 1942. The theatre seats 1,210.

An earlier theatre of this name stood in the Strand, four doors W. of Surrey St. Converted from a panoramic exhibition in 1831, it was licensed in 1836, and rebuilt 1882. Associated with the Swanborough family for many years, it closed in 1905.

Strang, HERBERT. Pseudonym of Charles J. L'Estrange (d. 1947) and George H. Ely, who collaborated under this name in writing adventure stories for boys. The ideas were invented by L'Estrange, Ely writing them up. Their first "annual," 1908, was the forerunner of many publications for children by the Oxford University Press, a firm with which both writers were associated.

Strang, WILLIAM (1859-1921). British painter and etcher. He was born at Dumbarton, Feb. 13, 1859, was educated at University College, London, and studied under A. Legros (q.v.) at the Slade school, London. He attained remarkable distinction as an etcher, ranging over a vast variety of subjects, and emulating Rembrandt's broad masses of light and shade; for the

grim imagery of certain conceptions he is indebted to Holbein. He became A.R.A., 1906, and R.A. a few months before his death, April 12, 1921.

Strange, SIR ROBERT (1721-92). British engraver. Born at Kirkwall, Orkney, July 14, 1721, he was trained as a lawyer at Edinburgh, but afterwards studied engraving in London. Involved in the Jacobite rising of 1745, he fled to Rouen, studied there and in Paris, and, returning to England in 1750, was knighted in 1787. As a line-engraver of Van Dyck and Titian he is probably unequalled. Died July 5, 1792.

Strangers' Gallery. In the British parliament, name given to galleries to which members of the public are admitted, not as of right, but as a favour. In the house of commons the gallery faces the Speaker's chair. The public, who usually obtain admission through members, are not admitted until after prayers, and anyone making a demonstration or disturbance of any kind is promptly ejected by the assistants of the serjeant-at-arms. Moreover, on the cry "I spy strangers" the Speaker rises and orders the gallery to be cleared. Part is reserved for distinguished strangers. See *Commons*; *Parliament*; *Privilege*.

Strangford, VISCOUNT. Irish title borne by the family of Smythe from 1625 to 1869. Sir Thomas Smythe, created viscount in 1625, was a landowner in Kent. His descendant, Percy (1780-1855), who became 6th viscount in 1801, was British minister in Brazil, Sweden, Turkey, Russia, and elsewhere. His eldest son George, 7th viscount (1818-57), was an author and a Tory M.P., 1841-52. One of the Young England party, he is portrayed in Disraeli's *Coningsby*, and is also notable as having fought in the last duel in England. When George's brother, Percy, 8th viscount, died 1869, his titles became extinct.

Strangford Lough. Inlet on the E. coast of co. Down, N. Ireland. It penetrates inland for about 26 m., and its W. shore is lined with numerous small islands.

Strangles. Infectious disease of horses, due to a micro-organism. Of universal distribution, it shows itself by the presence of a cough, a discharge from the nostrils, and a swelling of the glands between the jaws, with fever. It occurs chiefly in young horses. See *Horse*.

Strangulation (Gr. *strangalē*, halter). Death from constriction of the neck by a force other than

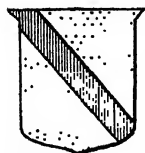


William Strang, British artist
Self-portrait

the weight of the body. Accidental strangulation occurs in a variety of ways. The suicidal kind is rare. Murder by strangulation is often effected by the assailant grasping the throat of his victim from behind. See Garrotte; Hanging.

Stranraer. Royal and police burgh and seaport of Wigtownshire, Scotland. It stands at the head of Loch Ryan, 7 m. N.E. of Portpatrick. There are rly. stations, a large tidal harbour, and regular steamer connexion with Belfast and Larne. The chief buildings in this commercial capital of Galloway are the old town hall and modern ones for public business. There are ruins of a castle. About 3 m. E. of the town is the seat of the earl of Stair, Lochinch, Castle Kennedy, with grounds which are remarkable for a collection of rare trees. Stranraer was made a burgh in 1596. Market day, Fri. Pop. 8,000. See Ryan.

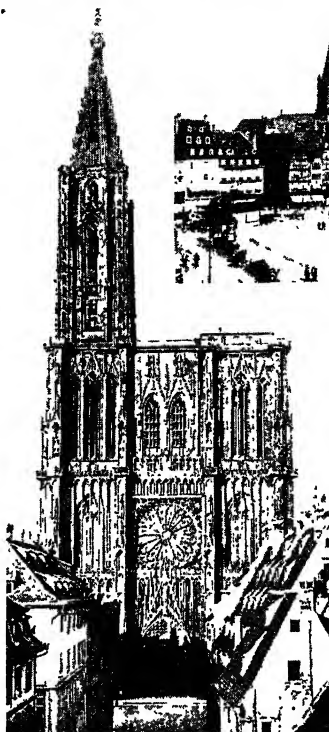
Strasbourg (Ger. Strassburg). City of France, capital of Bas-Rhin dept., centre of the Alsace region, and now seat of the Council of Europe. It stands on the junction of the river Ill with the Rhine, 10 m. E. of the Vosges mts. A main rly. junction and airport, the starting point of the Rhine-Marne and Rhine-Rhône canals, it has a port served by those waterways and a branch of the Rhine, handling between 5 and 6 million tons of shipping yearly. It is noted for



Strasbourg arms

pâté de foie gras and other food preserves, and has motor car, metal, and tobacco factories and book publishing houses. It was the seat of special government departments created in 1919 for Alsace-Lorraine; also a fortified military centre. It is an R.C. bishopric. Pop. 175,515.

Established as Argentoratum by the Romans on the site of a Celtic village, Strasbourg is rich in historical buildings. The cathedral is a red sandstone Gothic pile, with a S. tower 465 ft. high. Building was started in 1015 and completed c. 1430. Here are some of the most famous medieval sculptures, a beautiful rose window, and a remarkable clock. Stained glass from the cathedral was recovered from a salt mine near Heilbronn after the Second Great War. Other churches are Old and Young S. Peter's, and S. Thomas's (13th-14th centuries), with monument to Marshal Saxe. The Frauenhaus, originally work-



Strasbourg, France. Place Kleber showing Temple Neuf on the left, and the cathedral, right. Left, west façade of the cathedral, begun in 1277

U.S. 7th army, recovered Strasbourg after a spectacular 18 m. dash through the Saverne gap. During the Ardennes counter-offensive, Eisenhower planned to strengthen the Allied line farther N. by withdrawing all but a few light elements from the neighbourhood of Strasbourg. French representations of the catastrophic political effects likely to follow in France a new loss of the city led him to modify his plan and keep Strasbourg adequately covered.

Strasser, GREGOR (1892-1934). German Nazi leader. By trade a chemist, he was born at Geisenfeld, Bavaria, May 31, 1892. He was sentenced with Hitler after the *putsch* of 1923 to 1½ years' detention, but released after his election to the Bavarian diet in May, 1924. In Dec. he was sent to the Reichstag, and at once was in charge of the Nazi party organization. Next to Hitler, Strasser was the outstanding figure in the movement until in 1932 he fell out with his chief for proposing to give up the revolutionary programme in exchange for the monies contributed by German industrialists. Strasser retired from political activities and accepted a directorship in the Schering chemical combine, but the vengeance of his former associates reached him, and he was assassinated in the "purge" of June 30, 1934.

Strasser, OTTO (b. 1897). A German publicist, brother of the above Gregor Strasser. He was born at Windsheim, Franconia, Sept. 10, 1897. A Socialist writer and editor, in 1923 he followed Gregor into the Nazi party; he edited its National Socialist Letters, and during 1926-30 was a director of the Nazi Kampf-Verlag, a publishing firm in Berlin. He clashed with Hitler in 1930 and founded a more revolutionary group, later known as the Black

shop of the builders (1357), now houses episcopal archives. The bishop's palace was built for Cardinal Rohan in 1728-41. Half-timber and gabled dwellings in the German style are the most interesting secular buildings. There are bridges of 13th and 14th century origin, and pompous official buildings of the German occupation, 1871-1919. The seat of a university (1567), Strasbourg has 20 libraries, 13 museums, two theatres, and the House of Europe (1950), built for the Council of Europe.

Historical associations start with the defeat of the Alemanni by the emperor Julian in 357. Strasbourg was a centre of German humanism and early adopted the Reformation. A free city from 1262, it fell under French suzerainty in 1648 and was annexed by Louis XIV in 1681. Taken by the Prussians after a siege in 1870, under the Versailles treaty of 1919 it went back to France.

The population was removed at the outbreak of the Second Great War, the city being only 2 m. from the Rhine. Captured on June 19, 1940, Strasbourg was completely Germanised, even street names and shop signs being changed. On Nov. 23, 1944, the French 2nd armoured div., spearhead of the

Front, which was ostracised as soon as Hitler assumed power in 1933. Strasser took refuge in Vienna, was deprived of German citizenship, and later went to Great Britain and Canada. His book, *The Structure of German Socialism*, 1932, and others written in wartime—*Hitler and I*, *Germany Speaks*, *Germany Tomorrow*—had widespread success. From 1947 he began to propagate a federalist policy based on religion and a regional outlook.

Strata Florida (Latinised from Welsh *Ystrad Ffŷr*, plain of the Ffŷr). Village and parish of Cardiganshire, Wales. It has a rly. station 5 m. N.E. of Tregaron. Four miles away, on the Teifi, are the ruins of the Cistercian abbey of Strata Florida, which when complete was one of the largest in Wales, and a centre of learning and statecraft. Founded in 1091 and partly destroyed in the 13th cent., it was dissolved by Henry VIII.

Strategic Air Force. Organization of the R.A.F. developed in the Second Great War for long-term planned offensive operations. It was distinct from the Tactical Air Force (*q.v.*), which worked in cooperation with the army, attacking targets as they presented themselves in the battle zones. The strategic air force was the spearhead of all three services, assailing ports, airfields, shipping, rlys., factories, etc., deep in enemy territory. Bombing German, Italian, and Japanese industrial centres was its main function, and its chief weapon was the heavy bomber.

Strategy (Gr. *stratos*, army; *ago*, lead). The art of war, whereas tactics is the method by which warfare is waged. Strategy is greatly hampered unless there is complete unity between political control and military command. This presents no great difficulty when one nation is concerned, but in the case of Allies neither political nor military unity can be easily achieved. In the early days of the world despotism often seized complete power and the consequent unity resulted in very fine examples of grand strategy. Alexander the Great, as tyrant of the Grecian states, became a complete despot, and his strategy stands as a model. The history of war shows that most great captains were despots: *e.g.* Caesar, Frederick the Great, Napoleon.

SECOND GREAT WAR. The outstanding feature on the outbreak of the Second Great War was the supremacy in land power possessed by the German armed forces. On

the sea her power was limited, and in the air her forces had been mainly restricted to army co-operation duties. German strategy was simple. She seized Austria, made a non-aggression pact with Russia to secure her eastern front, and conquered Poland. She then turned on France and overwhelmed her army. Strategically the Germans should most certainly have pursued their advantage and invaded Great Britain, but they failed in psychological appreciation of the position.

At that stage Great Britain had to consider future strategy. She could not attack Germany without landing on enemy soil, and she could not win the war without attacking Germany. Winston Churchill, who combined the offices of prime minister and defence minister, appreciated this situation and formed a h.q. to study combined operations. By far the most urgent need was for the special landing craft without which military forces could not land on enemy shores, but it was not until 1942 that construction of landing craft was given first priority.

Germany's strategy in Russia, which she had invaded in 1941, was during 1941 to advance on narrow fronts at a number of points and surround the Russian forces by pincer movements. But the bulk of the Russian army was able to withdraw into the vast Russian interior and was still in being in 1942. In fact the Russians were able with some success to assume the offensive during the winter 1941-42. In 1942 the Germans changed their strategy, and used their mechanised and armoured forces to advance at a large number of points on a wide front. This caused sufficient confusion to enable normal German formations to advance and occupy areas gained by the armoured forces.

"Second Front" Strategy

In the spring of 1942 the Russians were carrying the main burden of the war. The Germans had a total of 175 divs. on the Russian front and there was a strong demand that the Allies should reopen a front in W. Europe to relieve this pressure. The Germans had less than 30 divs. in France and the Netherlands, and the defensive works called the Atlantic Wall had hardly been started. From a strategic point of view this seemed to be a golden opportunity. But very few landing craft were available; U.S. land forces scarcely existed yet, the

U.K. had only 10 infantry and 5 armoured divs. and 10 army tank bdes. in Great Britain; the Allied air forces had not yet gained superiority over the Germans.

It was decided therefore that no attempt to land in France could be made in 1942, and the Allies were undoubtedly right in not taking this risk under the conditions that existed at that time. But Winston Churchill had never forgotten his desire in the First Great War to find "an easy way round" via the Balkans. This idea was now extended to an attack on Germany from many points in the Mediterranean—an attack on, as he called it, the "soft under-belly of the Axis." The first step was to take the N. African coast, after that to capture Sicily and the toe of Italy.

Mediterranean or English Channel?

The strategy of squeezing out the Germans and Italians by attacking from both ends of the N. African coast proved to be sound. In the meantime Russia had won a winter campaign and had followed this up with success for the first time in a summer campaign in 1943. The Russians had about three times the strength of the Germans on that front. The Allies were making good headway in the submarine war and in gaining naval control in the Atlantic. The choice now lay between attacking Germany across the Channel from England, or from the Mediterranean. The U.S.A. considered that the Allies should turn their efforts to an assault across the Channel at the earliest possible moment after the winter operations in N. Africa had been concluded. The British prime minister and C.I.G.S. were strongly attracted to the plan of attacking Germany from the Mediterranean; and from a purely strategical point of view they were probably correct. A compromise plan was therefore adopted. Forces of limited strength and some landing craft were to be left in the Mediterranean, while the bulk of the Allied forces were concentrated in the U.K. This resulted in a serious dispersion of the Allied forces.

If the U.S. plan of concentrating all available resources at the earliest possible moment in the U.K. had been adopted it would have been possible but risky to launch the offensive in 1943. If the U.S.A. had agreed that all forces should be concentrated in the Mediterranean, final victory might have been secured six months sooner than it was. A

great and vital risk was, however, involved in this plan. The Allies already had considerable knowledge about the German plans for the manufacture of rockets and other reprisal weapons to be installed in the N. of France and in the Netherlands. Had the Allies advanced from the S., the Germans might have been able to wreck the Allied bases in England while they delayed the Allied advance from the S. An advance across the Channel would lead the Allied forces directly on to the areas where these weapons were installed; and this in fact happened, just saving England from great devastation.

D-Day Strategy, and After

Strategical considerations as regards the locality at which the landing was to take place were comparatively simple, but Allied strategy after landing was more difficult. The period during which the Cotentin pen., with Cherbourg, was being captured, and a secure defensive ring extending some 15 to 20 m. inland from the landing beaches was being established, was seen to be the most dangerous. A strong counter-attack during the first 10 days after the landing might have met with success. The Allies, however, had spread false information with skill and success; and the German high command, convinced that the main landing was to be made farther E., refused to allow the withdrawal from elsewhere of the troops needed for such a counter-attack.

As strategy after the landing in Normandy the commanders of the British and U.S. armoured forces favoured advances at a few points on narrow fronts and pressing deep into enemy territory with a view to causing confusion and collapse of the opposing forces. This plan worked until the failure, through insufficiency of aircraft, of the air advance across the Rhine. After that, the Allies had to accept a plan of an advance up to the Rhine on the whole front. There were no special strategical considerations in the final stages of the war in Europe.

As soon as success was assured against Germany, all possible reinforcements in men and munitions were sent to the Far East. A degree of overwhelming strength was built up in that theatre and victory was in sight before the first atomic bomb was used. The great strategic power of comparatively small armoured forces, supplied by air to retain their mobility, was clearly demonstrated

in the Burma campaign. See Tactics; also First Great War; Second Great War.

Stratford. District of Greater London. In the co. of Essex, 4 m. by rly. N.E. of Liverpool Street, its old name was Stratford Langthorne. It is a ward of the bor. of West Ham. The bridge over the Lea, uniting Stratford with Bow (*q.v.*), replaced in 1839 one dating from the 12th century. The buildings include several churches, among them S. John's, 1834, a town hall, 1867-69, technical institute, municipal college, library, baths, and theatre. There are manufactures of chemicals, paint, varnish, and candles; printing works and breweries, and rly. workshops and depot.

A moated Cistercian abbey, founded in 1135, stood in the marshes on Abbey Creek, a branch of the Lea. It was dissolved in 1538.

Stratford de Redcliffe, STRATFORD CANNING, VISCOUNT (1786-1880). British diplomatist.



Viscount Stratford de Redcliffe, British diplomatist
After G. F. Watts

Born in London, Nov. 4, 1786, cousin of George Canning, he was educated at Eton and King's College, Cambridge. He held his first diplomatic appointment at 21, and was minister plenipotentiary at Constantinople in 1810; acting entirely on his own initiative, he negotiated the treaty of Bukarest, 1812. He held important appointments in Vienna, 1815, Washington, 1819, St. Petersburg, 1824, and Constantinople, as ambassador, 1825-28. When not employed in diplomacy, he sat three times in parliament as a moderate Tory.

From 1842 to 1858 he served again as ambassador to the sultan of Turkey, making there the extraordinary reputation so vividly described by Kinglake, which won him the title of the Great Elchi (Turkish for ambassador). Stratford de Redcliffe, who received his peerage in 1852, was an extremely skilful diplomatist and exercised almost boundless influence over the Turks. He must therefore take much responsibility for not averting the Crimean War. In 1856 he persuaded the sultan to grant reforms, including a decree securing rights for the Christians. He retired in 1858, and died at Frant, Aug. 14, 1880.

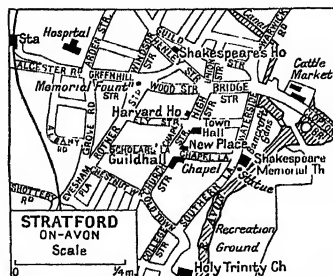
Stratford-upon-Avon. Mun. bor. and market town of Warwickshire, England. Pleasantly situated on the



Stratford-upon-Avon arms

at the Avon, it is 24 m. S.S.E. of Birmingham by rly. The fine cruciform parish church of Holy Trinity, restored 1891-92, dates principally from the 14th and 15th centuries. It contains the grave and monument of Shakespeare, with a portrait bust, and the grave of his wife, Anne Hathaway. The old guildhall, in which strolling players performed, was restored in 1892. The upper story is occupied by King Edward VI's grammar school, which Shakespeare attended. Before its refoundation it was connected with the Guild of the Holy Cross, the chapel of which still stands. The magnificent bridge of 14 arches which crosses the Avon was built late in the 15th century by Sir Hugh Clopton. A fine old house in the town was the home of the mother of John Harvard (*q.v.*).

The birthplace of Shakespeare in Henley Street was purchased for the nation in 1847 for £3,000, and contains a unique collection of books, pictures, etc., illustrating his life and times. New Place, in which the poet died, was acquired by him in 1597. It was destroyed in 1759, and its site, with a few remains, was purchased by public subscription in 1862, and handed over to the trustees of the birthplace. The new Shakespeare Memorial Theatre (*q.v.*) was opened in 1932. A fine statue of Shakespeare was presented by Lord Ronald Gower in 1888, and a memorial fountain was erected in 1887 by an American, G. W. Childs. In the vicinity Charlecote Park, now National Trust property, Clopton, Luddington, Snitterfield,



Stratford-upon-Avon. Plan of the Warwickshire town intimately associated with Shakespeare



Stratford-upon-Avon, Warwickshire. Left, Shakespeare's birthplace in Henley Street, restored 1857-58. Right, the room in which the poet is said to have been born

and Wilmoote have memories of Shakespeare, and at Shotton is the cottage of Anne Hathaway.

An extensive trade in agricultural produce and cattle is carried on. The corporation supplies gas and water. Market day, Fri. In 691 a monastery was established at Stratford, which received a charter of incorporation in 1553. Pop. 11,616. See Harvard; Hathaway; Shakespeare.

Strath (Gael, open valley, from Lat. *strata*, a road). Name given in Scotland to broad valleys as distinct from glens, e.g. Strathspey and Strathmore (*q.v.*).

Strathaven. Market town of Lanarkshire, Scotland. It stands near the Avon, 16 m. S.S.E. of Glasgow, and is served by rly. Near the town are the ruins of the castle. * Strathaven, also called Avondale, was made a burgh in 1450. Market day, Tues. Population 5,902.

Strathclyde. Ancient British or Welsh kingdom in S.W. Scotland. Also called Cumbria, it included the basin of the Clyde and Ayrshire, and, at an early period, Cumberland. It appears to have been consolidated by Rhydderch Hen about 573. The capital was Dumbarton, anciently called Alcluth. Strathclyde submitted to Northumbria in 756, and to Edward the Elder of England in 925, and passed to Malcolm I of Scotland in 971, but was not fully merged in Scotland until the 11th century.

Strathcona. Town of Alberta, Canada, since 1912 part of Edmonton. Known also as South Edmonton, it stands on the S. bank of the N. Saskatchewan river and is connected with the city by a steel bridge 2,550 ft. long. Here are the buildings of the university of Alberta founded in 1906. Named after Lord Strathcona, the town had a pop. of 6,500 before its absorption by Edmonton (*q.v.*).

Strathcona and Mount Royal, DONALD ALEXANDER SMITH, BARON (1820-1914). A Canadian politician. Born Aug. 6, 1820, at Archiestown, Morayshire, Scotland, he emigrated to Canada when 18 years old. He worked for the Hudson's Bay company, being in Labrador for 13 years, followed by 10 in the Hudson Bay district. In 1868 he was transferred to Montreal, where he became general manager of the Hudson's Bay company in Canada, and eventually governor, an office which he retained to the end of his life.



Lord Strathcona, Canadian politician
Russell

In 1869 open rebellion began in the Red River Territory under Louis Riel. Chosen as special commissioner to visit the rebels at Fort Garry, afterwards he stayed for some time among them, little better than a prisoner, but did much to break down opposition. When British troops arrived, Smith was requested to administer affairs at Red River. He was member of the executive council of the North-West Territories, represented Winnipeg in the Manitoba legislature, and was one of the first representatives of Manitoba in the dominion house of commons.

Realizing the necessity of railway communication with the Pacific, Smith, with his cousin, George Stephen, afterwards Baron Mount Stephen, and others, formed a syndicate to build the Canadian Pacific Railway (*q.v.*). They plunged into the colossal task with great zeal. The construction of the railway was begun in 1881. The last spike was driven in by Smith, Nov. 7, 1885, at Craigellachie in the Rockies

Knighted in 1886, Smith accepted in 1896 the high commissionership for Canada in England. In 1897 he was made a baron of the United Kingdom, with the title of Lord Strathcona and Mount Royal. He continued as high commissioner until his death on Jan. 21, 1914, at the age of 93, working regularly at his office until within a few days of the end. His title descended by special decree to his daughter, Margaret Charlotte Smith (1854-1921), whose son, Donald Sterling Palmer Howard (b. June 14, 1891), became 3rd baron. He occupied various govt. posts, and was captain of the Yeomen of the Guard, 1931-34.

Strathfieldsaye or **STRATFIELD-SAYE.** Parish and village of Hampshire, England. It is 7 m. S.E. of Basingstoke, near the river Loddon, and contains the estate granted by parliament to the first duke of Wellington in 1817. Purchased at a cost of £263,000, it was previously in possession of the earl of Chatham and his son, William Pitt. It is the seat of the present duke of Wellington. The estate is held by virtue of the quit-rent of a silk standard, tendered to the king on the anniversary of the battle of Waterloo, June 18.

Strathmore. Valley of Scotland. In the narrowest sense it consists of a tract of land extending between Brechin, in Angus, and Methven, in Perthshire.

Generally the Great Plain is regarded as comprising the area between the Grampian Mts. on the N. and the Lennox, Ochil, and Sidlaw Hills on the S., with a length of about 100 m. and a breadth averaging 8 m.

Strathmore and Kinghorne, EARL OF. Scottish title held by the Lyon family. Patrick Lyon, 9th Baron Glamis, head of a Scottish family which had held the barony since 1445, was created earl of Kinghorne in 1606. His grandson

Patrick, 3rd earl, was a lord of the treasury, and in 1677 was made earl of Strathmore and Kinghorne. His grandson John, the 5th earl, was killed fighting for the Pretender at Sheriffmuir, 1715, and was succeeded in turn by his three brothers Charles, James, and Thomas. John, 9th earl, son of Thomas, took the additional name of Bowes, and from him the subsequent earls are descended. Patrick Bowes-Lyon, 15th earl (1884-1949) was a brother of Queen Elizabeth. He was succeeded by his son Timothy (b. 1918). The family seat is Glamis Castle (*q.v.*), Angus, and an eldest son bears the courtesy title of Lord Glamis.

Strathpeffer. Village and watering-place of Ross and Cromarty, Scotland. It is 5 m. by rly. W. of Dingwall, and is overlooked by Ben Wyvis, 3,429 ft., from the N. It is noted for its mineral springs, sulphur and chalybeate, and has baths and hotel accommodation. Pop. 875.

Strathspey. Scottish dance said to have originated in the valley (strath) of the Spey. It has been compared with the reel, from which, however, it differs by its more broken movements in dancing, indicated in the music by the prevalence of dotted notes.

Stratification. In geology, formation of rocks into layers. Stratified rocks are usually sedimentary, and when the strata are very thin they are known as laminae. See Geology; Rocks; Sedimentary Rocks; Stratum.

Stratigraphy. In geology, the study of strata, or historical geology. It deals with the time-sequence of geological deposition and events, and the conditions under which the rocks were laid down. The absolute ages of rocks have been established with fair accuracy by measuring the degree of disintegration of radio-active elements contained in them. Most geological time-conceptions are relative, one time period being earlier or later than another, and no quantitative element of time is involved. By considering the sequence of deposition of strata one can state that certain beds are older or younger than those respectively above or below. This is the law of superposition. By examination of the fossil content of these beds the time-sequence of the appearance and disappearance of species has been worked out. The time relationship of igneous rocks to local sediments is shown by the age of the strata penetrated by intrusions or covered by lava

flows. By application of such principles a time succession for the formation of the rocks of the earth's crust has been built up.

The conditions in which rocks were deposited are shown by the characters of the rocks themselves. From observations of sedimentation still going on past conditions can be deduced. By recognition of and tracing deposits of a certain age laid down in varying depths of water, or on some past land surface, it is possible to outline ancient land and sea areas, and by attention to the character of the fossil fauna and flora, etc., to obtain some idea of the climatic conditions prevailing at that distant period. In the geological exploration of coal, oil, water, or other deposits associated with sedimentary rocks a detailed knowledge of stratigraphy is essential. (See Geology; Fossils; Earth Movements; Igneous Rocks; Sedimentary Rocks; consult Introduction to Stratigraphy, L. D. Stamp, 1923).

In archaeology, the stratigraphical method is also used, *e.g.* in certain caves the flint implements of early Palaeolithic men have been found in the lowest strata, sealed by a sterile stratum of detritus accumulated during a long period of abandonment by man. Above such a sterile layer may come strata containing late Palaeolithic flints and, in some cases, yet higher strata containing Neolithic remains. The sequence of the strata enables the archaeologist to determine the relative dates of the different cultures.

Stratosphere. Meteorological term. It was first applied in 1909 by Teisserenc de Bort to describe the external layer of the atmosphere, in which there is no appreciable convection, and which he had discovered 10 years previously. Professor Picard (*q.v.*) ascended to over 53,000 ft. in 1932; two Americans in 1935 reached over 74,000 ft.

The temp. of the air usually decreases with increase of height from the earth's surface, at an average rate of about 10° C. per mile; but eventually a level is reached where the upward decrease ceases. It was at first believed that the temp. of the stratosphere was isothermal, but it was revealed that the temperature is not always the same and may vary horizontally as well as vertically. Indeed, a high proportion of the balloon soundings into the lower stratosphere, made at a number of places on the earth, indicate that there is an increase of temp. with height. The temp.

of the stratosphere also varies with the latitude and the weather, *e.g.* over the poles it is -50° C. (-20° C. at the surface) and over the equator -80° C. (+25° C. at the surface). At the poles the mean rate of decrease of temperature is only about 5° C. per mile, owing to the inversion of temperature near the ground, but the chief reason for the lowest stratospheric temperature occurring over the equator is that the troposphere (*q.v.*) there extends to a greater height. On the average, the lower boundary of the stratosphere—the tropopause—is at a height of 10 m. at the equator compared with 5-6 m. at the poles; in England it may be about 5 m. during the type of weather associated with the passage of depressions and 8 m. in anticyclones.

Whereas the decrease of temp. vertically in the troposphere is due to the continual mixing and interchange of air between different levels, the nature of the temp. distribution in the stratosphere indicates that these processes are very limited. The main control of stratosphere temp. is attributed to radiation, the stratosphere absorbing the energy of sunlight and of the upward stream of low-temperature radiation from the ground and the troposphere, and, in turn, radiating outwards. Analyses of samples of air obtained at heights of up to 15 m. have shown that the change in composition is slight; ozone (*q.v.*) is, however, more plentiful in the stratosphere, the maximum recorded concentration being at about 17 m. The air of the stratosphere is extremely dry, even allowing for the low temperature, and as the driest air should lie over the equator, this is indicative of a general circulation in the stratosphere. With the exception of the beautiful iridescent "mother-of-pearl" clouds which have been seen occasionally after sunset, and located at a height of 14-18 m., the stratosphere is cloudless.

Because of the almost complete absence of cloud and rain, and the low density of the air reducing resistance, the stratosphere is an ideal medium for aircraft, and aeroplanes have been developed to fly in the substratosphere. Both military and civil long-distance aircraft normally fly at sub-stratospheric altitudes.

Stratospheric flight requires a specialised type of fuselage and power unit. Lack of oxygen renders the ordinary internal combustion engine inefficient and

necessitates the use of costly, heavy, and complicated supercharging systems and cooling devices. When the air is compressed by a supercharger it becomes exceptionally hot, and the thin air at great heights does not carry away the heat from the engine as quickly as does the more dense air at lower levels. Propeller traction also is inefficient at stratospheric altitudes, as the thin air does not offer sufficient "body" for the propeller to grip and screw its way forward. The most efficient power unit for high altitude flying in stratospheric conditions is the jet or rocket, which operates through the reaction to a rear discharge and has few moving parts to overheat.

Lack of oxygen in the stratosphere prevents human beings from breathing, and aircraft for stratospheric flight must have sealed pressurised cabins. These cabins are maintained at an interior pressure eight to ten times greater than that obtaining outside. Experiments since the Second Great War have indicated that the speed of rocket-propelled flight in the stratosphere is limited only by the structural strength of fuselage and power unit. *See Meteorology; Radiation; Troposphere.*

Stratton. Market town of Cornwall, England, part of the urban dist. of Stratton and Bude. It is 16 m. N. by W. of Launceston, standing in a valley surrounded by high hills. The station is Bude, 1½ m. On Stamford Hill, just outside the town, a parliamentary army was defeated by the Cornishmen under Sir Bevil Grenville and Sir Ralph Hopton on May 16, 1643. Pop. 3,000.

Stratton, EUGENE (1861-1918). American singer. He was born at Buffalo, N.Y., May 8, 1861, and made his first stage appearance at the age of ten.



Eugene Stratton,
American singer

In 1880 he came to London, and after ten years with the Moore and Burgess Minstrels he was engaged at the Holborn Music Hall, 1892, and thereafter gained great popularity throughout the country with his coon songs, such as the famous Lily of Laguna. He died Sept. 8, 1918.

Stratum OR BED. In geology, name given to a single layer (plural strata) of sedimentary rock.

These rocks were deposited on the bottoms of former seas or lakes, on the surfaces of plains and deserts etc., and the term stratum is very similar to that of seam or layer. One stratum is separated from another by bedding planes, which show an interruption in the process of formation of the strata. *See Geology; Stratigraphy.*

Stratus. Uniform sheet of low cloud, resembling fog but not resting on the ground, and so called because it has the appearance of layers or strata. In the British Isles it usually forms at heights of 500-2,000 ft., tending to disperse during the day in summer and to persist in winter. *See Cloud.*

Straubing. Town of lower Bavaria, Germany. It stands on the right bank of the Danube, 26 m. S.E. of Ratisbon. The chief buildings are the castle, once the residence of the dukes of Bavaria; Straubing, the churches of S. Peter, S. James, and S. Ursula, the Carmelite church, and the town hall which dates from 1382. There is a clock tower 215 ft. high, which was built in 1316. Straubing has associations with Agnes Bernauer, who was drowned here as a witch in 1435. After the Second Great War it came within the American zone of occupation. Pop. 36,000.

Straus, OSCAR (b. 1870). Austrian musician, who in 1939 became a naturalised Frenchman. He was born March 6, 1870, in Vienna. He wrote music for the light operas, *A Waltz Dream* and *The Chocolate Soldier*, performed in London in 1908 and 1910 respectively. From youth until 1900 he was conducting at theatres in Vienna and Berlin, but later he lived in New York and Paris.

Strauss, DAVID FRIEDRICH (1808-74). A German theologian. Born at Ludwigsburg, Jan. 27, 1808, and educated at Tübingen and Berlin under Baur and Schleiermacher, he became a teacher. In 1835 he published his *Life of Jesus*, which was translated into English by George Eliot, and caused a great sensation by its extreme standpoint, from which Christianity was viewed as a myth and Christ simply as a Jewish philosopher. Strauss had been elected to the chair of philosophy at Zürich, but was at once retired, and he then virtually abandoned Christianity altogether. His later published works were largely attacks on Christianity, which he now regarded as a kind of pantheistic combination of Greek and Jewish mythology. He died Feb. 8, 1874.

Strauss, GEORGE RUSSELL. Contemporary British politician. Son of a Conservative M.P., he was educated at Rugby, and joined the Labour party during the 1920s. He was M.P. for N. Lambeth 1929-31 and 1934-50, thereafter for Vauxhall. A close associate of Sir Stafford Cripps, with whom he was expelled from the labour party 1939-44, he was his parliamentary private secretary 1942-45. In 1947 he became minister of supply. On the L.C.C. he represented N. Lambeth 1925-31, and S.E. Southwark 1932-46, and served as chairman of the supplies committee during 1937-39.

Strauss, JOHANN (1804-49). Austrian composer, born in Vienna, March 4, 1804. At 15 he joined a band as violinist, and from 1826 toured his own orchestra throughout Europe. The acknowledged originator of the Viennese waltz, he composed 152, as well as 24 galops, 32 quadrilles, 13 polkas, etc. He died Sept. 25, 1849.

Strauss, JOHANN (1825-99). Austrian composer. Born in Vienna, Oct. 25, 1825, he was the son of Johann Strauss (v.s.) and after an attempt at a business career, turned to music and succeeded his father as conductor of his orchestra.



From 1863 he devoted himself to composition, and outdid his father's fame with such astonishingly successful waltzes as *The Blue Danube*, first performed in 1867. His light operas, full of flowing and rhythmic melodies, included *Indigo*, 1871; *Die Fledermaus*, 1874; *A Night in Venice*, 1883; and *The Gypsy Baron*, 1885. Strauss was the acknowledged master of waltz composition in the Viennese tradition. He wrote over 400 waltzes, as well as polkas, mazurkas, and galops. He died in Vienna, June 3, 1899.

Strauss, RICHARD (1864-1949). German composer. Born June 11, 1864, at Munich, he was educated in music from childhood, and studied aesthetics and philosophy at Munich university, 1882-83. His symphony in D minor was played in 1881, a violin



Richard Strauss,
German composer

concerto in 1883, and his remarkable F minor symphony in 1884 in New York. Assistant conductor to Bulow, 1885, he came under the Wagnerian influence, as his tone poems, Don Juan, 1889, and Death and Transfiguration, 1890, bear witness. Till Eulenspiegel, 1895. Don Quixote, 1898; Ein Heldenleben, 1899; and the Sinfonia Domestica, 1904, represent further developments of the symphonic poem. Strauss turned to opera with Guntram, 1894, and Feuersnot, 1901, and caused a great sensation with more daring operatic experiments in Salome, 1905, and Elektra, 1909. Der Rosenkavalier, 1911, was in lighter vein, but later works were not so successful. He first appeared in London in 1922, and conducted there in 1947. He died at Garmisch, Sept. 8, 1949.

Strauss's orchestration roused much controversy. He not only worked for effects beyond those of Wagner, but added specially made instruments for certain effects. A master of cacophonous scoring, he could nevertheless write melodies worthy of the great masters, as shown especially in his songs; and in spite of his failures is probably the foremost German composer of his generation. *Consult* Richard Strauss, E. Newman, 1908.

Stravinsky, Igor Fedorovich (b. 1882). Russian-born American composer, born at Oranienbaum.



Igor Stravinsky, American composer

June 5, 1882. On Rimsky-Korsakov's advice he abandoned law for music in 1902. His early orchestral music, including Fireworks, attracted the attention of

Diaghilev, by whom he was commissioned to compose for the ballet The Firebird, 1910. Next year was produced his masterpiece Petroushka, unsurpassed in the development of the ballet. Le Sacre du Printemps, 1913, expressed elemental brutality in a manner never before successfully attempted. Later ballets included Pulcinella, 1919; Les Noces, 1923; Le Baiser de la Fée, 1928. He composed operas, The Nightingale, 1914, and Mavra, 1922, and the oratorio Oedipus Rex, 1928. Stravinsky's principle from 1910 to about 1930 was that music should make a purely physical appeal. A master of cacophony and counterpoint, he exploited to the full the possibilities of orches-

tral texture and individual instruments. Then he adopted a severely classical style in such works as Symphonie de Psaumes (for choir and orchestra), 1930; concerto for two pianos, 1935; concerto for 16 instruments (Dumbarton Oaks), 1938; symphony in C, 1943. Stravinsky lived in Paris for many years, but went to the U.S.A. shortly before the Second Great War and became an American citizen in 1945. He published Chronicle of My Life, 1936; The Poetics of Music, 1948. *Consult* Life, E. W. White, 1947.

Straw. Stems of cereals (white straw crops) and also those of pea and bean (black straw crops). The latter is a valuable fodder, more nutritious than cereal straw. By chaffing or steaming pea straw it can be converted into useful fodder for milch cows and ewes.

Cereal straws, especially of wheat, are universally employed as litter, which afterwards has an important mechanical action on the soil as a constituent of manure. Straw is valuable as a fodder in the case of cattle and other ruminants, not only on account of the nutritious substances it contains, but also because the comparatively indigestible fibre gives the necessary bulk required to fill the large paunches of these animals. Another important use of cereal straw on the farm is for thatching (*q.v.*). It is further used for packing, stuffing mattresses, making certain kinds of paper and cardboard (see Strawboard), and for straw-plaiting. Wheat straw is used in the last-named industry, the crop being pulled, not cut, and the ears removed by hand, after which the straw is stripped, cut up, sorted into different sizes, and tied into bundles. *See* Fodder; Hat; Litter.

Strawberry (*Fragaria*). Genus of perennial herbs of the family Rosaceae. The leaf is a trefoil, rough and toothed, hairy upon the underside; the white or yellow five-petalled flowers are unisexual. The edible fruits consist of a fleshy receptacle, with numerous achenes embedded on the surface. Of the ten species, *F. vesca* is a native of Great Britain, and, but for its smaller size, is similar to the cultivated varieties. The chief garden varieties have been derived from the wild strawberry, the Virginian (*F. virginiana*), the Chilean (*F. chilensis*), and the haitbois (*F. elatior*).

The strawberry propagates itself by means of fast-growing runners. Roots should be planted in autumn or spring, in a deep,

well-drained loam, free from clay, and on a S. slope, if it is intended to grow the fruit in large quantities. The plants should be established in rows 2 ft. or 2 ft. 6 ins. apart, with a space of 12 ins. between each plant. In spring the beds should have a mulch of manure, and later a layer of straw should



Strawberry. The edible fruit in different stages of growth

be spread about the roots of the plants. This precaution is to prevent heavy rains from causing the surface soil to splash up and damage the fruit during formation and development.

All runners should be removed from the plants and pegged on to the surface of the bed, to be potted up in Aug. or Sept. when rooted. By potting up runners of early and late sorts, and by the judicious use of glass protection at varying temperatures, it is possible to obtain strawberries all the year round, although the out-of-season fruit lacks flavour and often colour. In addition to propagation by runners, strawberries may be increased from seed sown in boxes in the greenhouse in spring. Strawberry plants should be renewed every three years to obtain the best results. *See* Fruit.

Strawberry Hill. London suburb. It is between Twickenham and Hampton, in Middlesex. The district, which has a rly. station, takes its name from the villa built in 1747 by Horace Walpole, originally a cottage overlooking the Thames. Walpole purchased it from a Mrs. Chevonix and built a little false-Gothic stucco castle, where he lived for the remainder of his life, amassing a wonderful collection of pictures and curios which was dispersed at the Waldegrave sale in 1842. *See* Walpole, Horace.

Strawberry Tree (*Arbutus unedo*). Small evergreen tree of the family Ericaceae, a native of the Mediterranean region and Ireland. It attains a height of

only 10 or 12 ft., and has red-tinged, scaly bark. The alternate oval leathery leaves have toothed



Strawberry Tree. Twigs bearing foliage, flowers (top), and fruit

edges, and the creamy, bell-shaped flowers droop in clusters. The fruit is a round orange-red berry, whose entire surface is raised into little points. It takes over a year to develop fully and ripen, when it is edible but not very desirable, except as a preserve. See *Arbutus*.

Strawboard. Type of cardboard. Made from crude straw pulp, usually in sheets 30 ins. by 25 ins., it is used for cheap bookbinding and for mounting photographs.

Straw Plaiting. Industry preparatory to the manufacture of straw hats. It was originally carried on in Italy. The best straw for this purpose is grown in Tuscany, being that of a special kind of wheat. Before the wheat is ripe the plant is pulled up, and the straw is dried and submitted to other processes before it is ready for the plaiters. Soon after 1600 straw plaiting was introduced into England, and in Bucks and the adjacent counties straw was grown for the purpose, being then cut, selected, and prepared. The plaiting gave employment to thousands of women, and the hats were made at Luton and elsewhere, but towards the end of the 19th century the import of plaits from Japan and Italy almost destroyed the industry in England.

Streamlining. Popular name for a method of design of aircraft, motor vehicles, rly. engines, intended to reduce their resistance to the air during movement. It is dependent on a study of the dynamics of gases, particularly as related to the influence of forces acting on bodies in motion in the air. See *Aerodynamics*; *Fairing*; *Head Resistance*.

Streatham. Residential suburb in S. London. In the met.

bor. of Wandsworth, it is about 6 m. from the City, with which it is connected by trams, buses, Green Line services, and three rly. lines. It comprises Streatham proper, where are remains of the old village, and the more modern Streatham Hill. S. Leonard's is the chief of several churches. Streatham Common is a fine open space covering about 60 acres. Connected with it are the grounds of the Rookery, now public property. Streatham has associations with Johnson and the Thrales. Streatham is a bor. constituency of Wandsworth. Pop. 68,435.

Street. Urban dist. of Somerset, England. It may be reached by rly. and is 14 m. E. of Bridgwater. There are tanneries, vehicle works, leather board mills, and manufactures of footwear. Pop. 5,000.

Street, ARTHUR GEORGE (b. 1892). British farmer and writer. Born April 7, 1892, at Ditchampton



A. G. Street, British writer

farm, near Salisbury, he succeeded to the ownership on the death of his father in 1917. Educated at Dautsey's school, Devizes, he was farming in Manitoba before the First Great War. Of some 20 country studies and partly autobiographical volumes, the first and best known was *Farmer's Glory*, 1932; *Country Calendar* appeared in 1935, *A Year of My Life* in 1939, *Ditchampton Farm* in 1946. Street was also a broadcaster and lecturer.

Street, GEORGE SLYTHE (1867-1936). British writer. Born July 18, 1867, at Wimbledon, and educated at the Charterhouse and Exeter College, Oxford, he was one of W. E. Henley's disciples and wrote essays and other works distinguished by observation, characterisation, and dramatic instinct. The essays include *Miniatures and Moods*, 1893; the satires, *The Autobiography of a Boy*, 1894; the novels, also satirical, *The Wise and The Wayward*, 1897, and *The Trials of the Bantocks*, 1900. He also wrote *The Ghosts of Piccadilly*, 1907; *At Home in the War*, 1918. In 1914 Street became joint examiner of plays, and in 1920 reader of plays. He died Oct. 31, 1936.

Streicher, JULIUS (1885-1946). German Nazi politician. He was born Feb. 12, 1885, at Fleinshausen. Soon after the First Great War, in which he fought with distinction, he was

dismissed from his post as a teacher at Nuremberg for a penal offence. In 1921 he founded the violently anti-Semitic group called Germanic Socialists, soon merged with the Nazi party; he took part in Hitler's *putsch* of 1923 and was imprisoned with him. Released, Streicher started in 1924 *Der Stürmer*, a pornographic anti-Jewish weekly. Member of the Bavarian diet and of the Reichstag from 1932, he was appointed Gauleiter of Franconia as soon as Hitler assumed power. He made a huge fortune from his paper, advocating the most brutal exploitation of power. One of the major war criminals indicted at the Nuremberg trials, he died Oct. 16, 1946, at the hands of the hangman.

Julius Streicher, German politician

Streit, CLARENCE KIRSHMAN (b. 1896). American political theorist, the leading advocate of federal union. Born Jan. 21, 1896, he was educated at Montana university and the Sorbonne. After serving in the First Great War he became a journalist, and was Geneva correspondent to the *New York Times*, 1929-38. His much discussed book, *Union Now*, 1938, proposed that a nucleus of the leading democracies should form a federal union designed to merge into the united states of the world. Local committees established throughout the U.S.A. led to the foundation of Federal Union, Inc., of which Streit became president. *Union Now with Britain*, published 1941, proposed this move as a first step.

Strength Through Joy (Ger. *Kraft durch Freude*). Nazi social organization. Copied from the Italian Fascist *Dopolavoro* (literally, after work), and started in 1933 as a branch of the German labour front under Dr. Ley, it was intended to appeal to the whole working population by providing free or at nominal fees spare time musical, theatrical, sporting, and other entertainments. Its main success was with arranged tours and holidays. By 1937 nine million people were enjoying week-end or longer holiday trips, for which ships were specially built or chartered, huge camps and seaside resorts created, and walking expeditions organized.

Strepsiptera OR **STYLOPS** (Gr. *strepsis*, twisting; *pteron*, wing). Name given to a small group of

minute insects whose larvae and adult females live as parasites within the bodies of bees, wasps, and other insects. The females are maggot-like, while the males are active creatures resembling small beetles. About 16 species are British. The name *Stylops* is that of one of the typical kinds.

Streptococcus. Germ named after the Greek word (*streptos*) for a necklace, because under the microscope its appearance is like that of a string of beads. This micro-organism has many varieties and is the cause of erysipelas, septicaemia, and dangerous inflammatory conditions. Penicillin and the sulphagroup of drugs are normally antagonistic to it.

Streptomycin. Antibiotic drug originated in the U.S.A., and obtained from certain strains of the soil mould *Streptomyces griseus*. When first used streptomycin produced dangerous side-effects due to certain toxic properties; an antidote for these has been found. The drug is prescribed for some tuberculous infections. An improved form was called neomycin. See Penicillin.

Stresa. Village in the Novara prov. of Piedmont, Italy. Situated by the W. shore of Lake Maggiore, it is on the Simplon rly. and 75 m. N.E. of Turin. It has fine scenery and is a holiday resort. Stresa gives its name to a conference held here between 15 European powers in 1932 on the initiative of Mussolini to discuss financial and economic problems of central and eastern Europe and control of the Danube basin. On major issues Italy sided with the western powers against Germany.

Stresemann, GUSTAV (1878-1929). German statesman. Born in Berlin, May 10, 1878, of modest parentage, Stresemann secured a university education, a doctor's degree, and in 1902 the secretaryship of an industrial organization at Dresden. Elected to the Reichstag as a Liberal in 1907, he led that then important party from 1917, reconstructing it in opposition to the Left-wing majority. At the crisis of the Ruhr occupation and the inflation of 1923, he was called upon nearly unanimously to form a coalition cabinet.

Chancellor and foreign minister from Aug. to Dec., when the Socialists left the ministry, Stresemann

stayed as foreign minister and was the outstanding figure in all German govts. until his death, Oct. 3, 1929. The Locarno treaty (*q.v.*) of 1925 and cooperation with Briand and Sir Austen Chamberlain inaugurated a systematic attempt at European unification, based upon economic needs and reciprocal interests. Stresemann effected the entry of Germany into the League of Nations. He was awarded the Nobel peace prize in 1926 jointly with Briand. Much attacked by Right-wing elements, and suffering from kidney disease, he spent his energy, oratorical power, and gifts as a writer unsparingly, in parliament, and at Geneva, London, Paris, and The Hague. *Consult* Life, A. Vallen-tin, 1931: Diaries, Letters, and Papers, ed. E. Sutton, 1935.

Stretcher. Appliance for carrying helpless persons. It usually consists of two poles, each about 8 ft. in length, between which is stretched canvas some 6 ft. long and 2 ft. wide. One foot is thus left at each end of the poles to serve as handles. Short legs keep the stretcher from the ground. See Ambulance; First Aid.

Stretford. Borough of Lancashire, England. Until the charter of incorporation was granted in 1933, it was a S.W. district of Manchester. Within the borough are four rly. stations, Trafford Park industrial estate, and the Lancashire county cricket ground, Old Trafford. Numerous heavy and light industries cover a range of mechanical construction and food processing. Pop. est. 61,000.

Stretton, HESBA. Pen-name adopted by Sarah Smith (1832-1911), British writer. Born July 27, 1832, at Wellington, Salop, she was a constant contributor to Household Words and All the Year Round. Her first book, *Jessica's First Prayer*, 1867, was translated into nearly every European language. Her other works include *The Doctor's Dilemma*, 1872; *Through a Needle's Eye*, 1879; *Her Only Son*, 1887. She helped to found the London Society for the Prevention of Cruelty to Children. She died Oct. 8, 1911.

Striation (Lat *stria*, groove). In geology, the cutting of grooves or scratches on a rock surface by the passage over it of a glacier, containing boulders picked up by the ice. The direction of striation shows that in which the ice was originally moving. See Glacier; Ice Age.

Strickland, AGNES (1796-1874). British historian. Born in London, August 19, 1796, and educated at home, after her father's death in

1818 she took up writing for a livelihood. Her most successful work was the *Lives of the Queens of England, 1840-48*, written in collaboration with her sister Elizabeth, as were *Lives of the Queens of Scotland and English Princesses, 1850-59*; *Seven Bishops, 1866*; and *Tudor Princesses, 1868*; though all were published in her name alone. She died at Southwold, Suffolk, July 13, 1874.

Strickland, GERALD STRICKLAND, 1ST BARON (1861-1940). British administrator. Born May 24, 1861, he was educated at Oscott and Trinity College, Cambridge, and became a barrister. In 1889 he was appointed chief secretary to the Maltese government. He was successively governor of the Leeward Islands, 1902; Tasmania, 1904; W. Australia, 1909-13; New South Wales, 1912-17. He went back to Malta in charge of the ministry of justice, 1927-32, his tenure of office being marked by bitter controversy with the R.C. Church. An unsuccessful attempt was made on his life. Strickland represented Lancaster as Conservative M.P. from 1924 to 1928, when he was raised to the peerage. Proprietor of *The Times* of Malta, he wrote on the constitution and history of the island. He died Aug. 22, 1940. His daughter, Mabel E. Strickland, editor of *The Times* of Malta, contributed the article in this work on Malta in the Second Great War.

Stricture. Abnormal narrowing of a natural passage in the body, such as the gullet, intestine, or urethra, so as to cause obstruction. The most common causes are inflammation, *e.g.* inflammatory stricture of the gullet after the swallowing of corrosive poisons, and new growths, *e.g.* cancer. When the word is used without further limitation, stricture of the urethra is meant. This common disorder is most often due to gonorrhoea, and may lead to inflammation of the bladder and other serious complications. The condition is generally treated by the passage of instruments known as sounds, of successively larger size, so as to dilate the constricted part.

Strike. Term for the withdrawal of their labour by a group of workers. The word was first used in print in this sense in the Annual Register of 1768 in reference to hatters having struck for a rise in wages, and appears to derive from the sailors' term striking the mast, which brings the movement of the ship to a stop. The complementary action of an employer



Gustav Stresemann,
German statesman

of refusing to allow his men to work is called a lockout.

The object of most strikes has been to secure wages increases and/or recognition of a trade union and of the right to collective bargaining. Notable strikes in the U.K. were that of 672 match girls in E. London, 1888, which secured some amelioration by their employers of the harsh conditions of their labour; the successful E. London dockers' strike, 1889, for a wage of 6d. an hour (the "dockers' tanner"), in which Ben Tillet, Tom Mann, and John Burns came to the fore; the miners' strike, 1912, involving nearly a million men, for a national minimum daily wage, which failed in its object but led to legislation establishing district minima; the railwaymen's strike, 1919, against a threatened wage reduction; the General Strike (*q.v.*), 1926.

By the 20th century the right to organize in trade unions, and to collective bargaining, had been generally recognized in the U.K. The Conciliation Act, 1896, empowered the board of trade to inquire into the causes and circumstances of a dispute, and to take steps towards bringing the parties together by appointing a conciliator or board of conciliation, and to appoint an arbitrator. These powers were subsequently transferred to the ministry of Labour, which has an industrial relations dept., one of whose functions is conciliation.

During both Great Wars arbitration was made compulsory. The Industrial Courts Act, 1919, established a permanent and independent tribunal to consider trade disputes submitted to it. Its decisions are not enforceable, but when a decision is accepted it becomes a part of the contract of employment. The Act empowered the minister to establish a court of inquiry to ascertain judicially the facts of a major dispute, and to report to parliament. See Trade Disputes Acts.

Strindberg, AUGUST (1849–1912). Swedish author. Born Jan. 22, 1849, at Stockholm, the son of a small tradesman, he studied at Uppsala and became teacher in an elementary school in Stockholm, afterwards turning to journalism and the drama. His first play, *Master Olof*, 1872, was unsuccessful. He obtained a post in the royal library at Stockholm, and wrote his first novel, *The Red Room*, 1879.

Strindberg spent the greater part of the next three years in

Paris, Switzerland, and Germany, where he met Nietzsche. His first two novels, bitterly satirical at the



August Strindberg,
Swedish author

expense of Stockholm society, had made him very unpopular among his own people; his volume of cynical stories of married life, *Marriages*, 1884, was held to be an outrage on the Christian religion, and in 1885 Strindberg returned to defend himself in court against his accusers. His trial resulted in an acquittal. In 1885 he published *Real Utopias*. Two of his best works of fiction, *The People of Hemsö* and *The Life of the Skerry Men*, masterly pictures of Swedish life, followed, 1887–88. In 1887 he wrote the play *The Father*, in which his bitterness against women finds expression.

In *Confessions of a Fool*, 1893, translated into English by Ellie Schleussner, he tells the story of his first unhappy marriage, dissolved in 1891. His second marriage brought about a mental crisis which led to his being placed for a time in a sanatorium. His *Inferno*, 1897, a strange study in abnormal psychology, throws much light on his state of mind during this period. The ten years 1898–1908 were very fruitful, producing—in addition to novels, volumes of autobiography, and scientific treatises—no fewer than 29 dramatic works; some of them, such as *Gustavus Vasa*, historical. Others, such as *Christmas*, full of symbolism and mysticism. He died May 14, 1912. Many of his books were trans. into English. *Consult Lives*, L. Lind-af-Hageby, 1913. G. A. Campbell, 1933. E. Sprigge, 1948.

String (*A.S. streng*). Fine, twisted cord for tying parcels, etc. It is made of several strands of hemp, flax, or cotton tightly twisted, wound into balls, and sold by weight. The word is often used to denote anything which forms a line, as a string of cattle, of beads, or a thread upon which a series of things is filed or hung. In music the strings of such instruments as pianos, harps, violins, etc., are made of wire, steel, brass, or catgut—plain or coated with silver.

String Course. In architecture, a horizontal course of brick or stone carried along the face of a building and round angular projections, so as to bind together the

detached portions of an irregular design.

Stripe. In military usage, a mark of rank for the three lowest grades of non-commissioned officers in the British army. See *Chevron*; *Rank*; *Sergeant*, etc.

Stroboscopic Effect. Optical phenomenon. If a body rotating with uniform angular velocity is viewed with intermittent illumination, and the cyclic frequencies are the same or are small multiples of each other, a given point on the body being viewed will appear stationary. This effect is made use of in industry for examining machinery in motion, the source of illumination being adjusted until the moving part appears at rest. The device utilising this effect is known as a stroboscope.

Stroke. Popular term for sudden onset of paralysis and other symptoms due to haemorrhage into the brain substance, or to a clot blocking the blood-supply. See *Apoplexy*.

Stromatopora (Gr. *stroma*, covering; *poros*, pore). Extinct genus of hydroid corals. They formed large coral reefs in Palaeozoic times, and remains are found in various localities in the U.S.A.

Stromboli. Volcano of the Mediterranean Sea. It rises to 3,040 ft. on the north-easternmost of the Lipari Islands, Italy, and is frequently designated the Lighthouse of the Mediterranean. It is continuously active, throwing out lava and "bombs" at intervals of 20 mins. to an hour. Hence the type of eruption known as strombolian. In August, 1907, and June, 1921, it erupted with some violence. The island has a pop. of 2,600, and an area of 5 sq. m. See *Volcano*.

Stromness. Police burgh, market town, and seaport of the Orkney Islands, Scotland. It stands on the S.W. of Pomona, 14 m. W. of Kirkwall, is a summer resort, and has a natural harbour accessible to the largest vessels. Market day, Wed. Pop. 1,692.

Strong, LEONARD ALFRED GEORGE (b. 1896). British writer. Of mixed Irish and West-country parentage, he went from Brighton College to Wadham College, Oxford. At first a teacher, he attracted attention by his verse, but his first novel, *Dewey Rides*,



L. A. G. Strong,
British writer

1926, brought general recognition. This was set on Dartmoor, but in later books, notably *The Garden*, 1931, and *Sea Wall*, 1933, Strong turned to the environs of Dublin for a setting. *The Brothers*, 1932, a story of the Hebrides, was the basis of a successful film, 1947. In 1945 a collection of his short stories, *Travellers*, was awarded the James Tait Black memorial prize. He also wrote criticism, and lives of Thomas Moore, 1937, and John McCormack, 1941.

Strongbow. Nickname of Richard de Clare, 2nd earl of Pembroke (d. 1176). In 1170 he went to Ireland, and, after subduing Waterford and Dublin, married Eva, daughter of the king of Leinster, succeeding to the kingdom in 1171. Strongbow allayed Henry II's jealousy of his successes by surrendering his conquests to the king, but for his services in the Normandy campaign of 1173, Wexford, Waterford, and Dublin were restored to him. Strongbow died at Dublin and was buried in the cathedral.

Strong Room. Fire- and burglar-proof room specially built for the safe custody of valuables. Such rooms commonly form part of a bank's premises, and are available for use by customers, who may deposit boxes containing jewelry, plate, securities, etc. The walls, floor, and ceiling are of ordinary or reinforced concrete, while the door is proof against fire and against attack by thieves. Strong rooms under constant guard are provided by safe-deposit companies for customers who rent them. *See Bank*; *Safe*.

Stronsay. One of the Orkney Islands, Scotland. It lies about 8 m. N.E. of Pomona, has an extreme length and breadth of $7\frac{1}{2}$ m. by $4\frac{1}{2}$ m., covers an area of 14 sq. m., and rises to 155 ft. Its coast is very irregular, the island consisting of three main peninsulas. The parish of Stronsay includes several adjacent islets.

Strontianite. Strontium carbonate, SrCO_3 . It occurs as orthorhombic acicular crystals, fibrous or granular, in colour variable from pale green and yellow to white; transparent to translucent. Strontianite is a source of strontium salts, and the chief commercial deposits are veins traversing Cretaceous marls and limestones in Westphalia, Germany; it also occurs in veins with galena, barytes, etc., and as nodules in limestones.

Strontium. One of the metallic elements. Its chemical symbol is

Sr, atomic number 38; atomic weight 87.63; density 2.54 gm per c.c., melting point 771°C ., boiling point $1,366^\circ\text{C}$. Strontium, one of the calcium group, is a hard yellowish metal, malleable and ductile, and oxidises easily on exposure to the air. It burns with a brilliant crimson flame, a characteristic colour of all strontium compounds when burning. It was discovered by Davy in 1808, and was so named from Strontian, Argyllshire, where the carbonate had been found by Crawford in 1790. It occurs in mineral form in celestine and strontianite, and in small quantities in a few other minerals. It can be prepared by the electrolysis of the fused chloride.

Strontium forms two oxides, the monoxide SrO and the dioxide SrO_2 . The hydroxide is used in the beet-sugar industry for the separation of sugar from beetroot molasses. Strontium nitrate is the substance which gives the red fire in fireworks. In medicine, the bromide, iodide, salicylate, and lactate are used for diabetes, Bright's disease, and rheumatism.

Strood. District of Rochester, Kent. The two parishes, Strood intra and Strood extra, stand on the left bank of the Medway, opposite Rochester proper. The district is served by rly. Pop. 9,463. *See Rochester*.

Strophanthin. Active principle, found useful as a heart tonic, of the seed of *Strophanthus Kembé*, a climbing shrub, native to tropical Africa. From the silky seed cast of this plant the natives produce a deadly poison for their arrow tips.

Strophe. In Greek chorus and dance, the part of a choral ode sung as the chorus passed from right to left, that sung on the return being the antistrophe (*q.v.*). *See Ode*. *Pron.* strofée.

Stroud. Market town and urban dist. of Gloucestershire, England. It stands at a point where several steep, narrow valleys on the W. fringe of the Cotswolds meet before opening into the Severn Vale, and is 12 m. S. of Gloucester by rly. A centre of woollen manufacture, Stroud has a number of cloth mills; it is noted for scarlet dyes, for which the water of the Frome is very suitable. The town has also sawmills, breweries, and iron foundries, and makes fibre board and plastics. Stroud has been connected with the cloth trade since the 16th century. During 1832-85 two M.P.s were elected, it is now in the co. constituency of Stroud and Thornbury. Market day, Fri. Pop. 15,880.

Stroud Green. Residential suburb of N. London. In the bor. of Hornsey, Middlesex, $3\frac{1}{4}$ m. N. of King's Cross, it occupies high ground between Highgate and Finsbury Park. Pop. 9,561.

Strube, SIDNEY (b. 1891). British cartoonist. Born in London, Sept. 30, 1891, he was apprenticed to a furnishing designer, and after studying at Hassall's art school, became a free-lance black-and-white artist. Joining the *Daily Express*, 1912, he became its chief cartoonist, until 1948. His "little man" became a widely quoted symbol of the British citizen. During 1927-41 he published annual books of cartoons.



Strube's "Little Man"

Struensee, JOHANN FRIEDRICH, COUNT (1737-72). German adventurer and Danish statesman. Born at Halle, Saxony, Aug. 5, 1737, the son of a clergyman there, he practised medicine at Altona, and in 1768 became private physician to the weak Christian VII of Denmark, with whom he established himself as a favourite. In 1771 he became minister of state and virtually dictator of a country the language of which he could not speak. He employed his power in enforcing reforms, the encouragement of education, the freeing of the press, trade, and industry. His revolutionary policy and his supposed liaison with the young queen Caroline Matilda, sister of George III of England, roused the nobles and clergy, who arrested him in Jan., 1772, tried him for the intrigue with the queen and for conspiracy against the throne, and had him executed on April 28.

Struma or KARA SU. River of the Balkans. Rising about 20 m. S. of Sofia, in Bulgaria, it flows generally S. through that country into E. Macedonia, Greece, and falls into the Gulf of Orfani, or Contessa, Aegean Sea. Its length is about 150 m.

Strut. Structural member to resist compression in the direction of its length, and to prevent bending actions induced by such compression. Struts are usually slender in section, and the permissible stress in them varies with their slenderness ratio. Typical struts used in building are those for

taking the strain on unframed timber roofs, and the struts of king and queen post roof-trusses. Pillars, columns, stanchions, and posts are forms of strut. The walls and roofs of timbered shafts and galleries in mines are supported by struts.

Various types of strut are used on aircraft. Biplanes have them between the wings, and certain monoplanes are strutted between wing and fuselage. With the development of the thick internally-supported wing, external strutting is now seldom used as it increases wind resistance. Dry docks subjected to high tides or strong wave action are equipped with auxiliary strut gates, consisting of hinged and framed shoring housed at the back of the gate recess, which can be swung into position at the rear of the impounding gates.

Strutt, JEDEDIAH (1726-97). British inventor. The son of a farmer, he was born at Blackwell, Derbyshire, July 28, 1726. He was apprenticed to a wheelwright, where his ingenuity in mechanical matters had scope, but he became a farmer. About 1755, with his brother-in-law, William Woollatt, he invented a machine by which ribbed hosiery could be produced. They started in business in Derby and were successful. Strutt was next associated with Arkwright in spinning cotton, in which other of his inventions were utilised, and the firm they founded had mills at Nottingham, Belper, and Cromford. He amassed a large fortune before he died at Derby, May 6, 1797. One of his descendants was Lord Rayleigh (*q.v.*).

Struve. Name of a family of German astronomers. Friedrich Georg Wilhelm von Struve (1793-1864) was the most important. Born at Altona, April 15, 1793, and educated at Dorpat (now Tartu) university, he was appointed an astronomer there in 1813, and became in 1839 the director of the newly built observatory at Pulkova, near St. Petersburg (Leningrad). There Struve carried out a series of remarkable observations and researches on double and multiple stars. He measured several thousand new star doubles, and his catalogues have proved of great value in checking new discoveries. He died at St. Petersburg, Nov. 23, 1864.

Otto Wilhelm von Struve (1819-1905), son of Friedrich, was born at Dorpat, May 7, 1819, and assisted his father in double star observations. On graduating he

was appointed assistant at Pulkova, where his work was in fundamental astronomy, geodesy, and double stars. In 1862 he succeeded his father as director. He retired in 1889 on the 50th anniversary of the foundation of the observatory, and died at Karlsruhe, Jan. 14, 1905.

Karl Hermann Struve (1854-1920), son of Otto, was born at Pulkova, Oct. 3, 1854, and educated at Viborg and Dorpat, continuing his studies in Paris and Berlin. In 1883 he joined the staff of Pulkova observatory, where he made exhaustive observations of the satellites of Saturn, Neptune, and Mars. Director of Königsberg observatory from 1895, nine years later he took charge of that of Berlin, which in 1913 he transferred to Babelsberg. He died Aug. 12, 1920.

Otto Struve (b. 1897), nephew of the above, was born at Kharkov, Aug. 12, 1897. Educated at Russian universities, he emigrated to America after the revolution and in 1921 was appointed assistant at Chicago university. Instructor at Yerkes observatory from 1924, he became director in 1932. He inaugurated the McDonald observatory in Texas and held its directorship till 1947. Work on interstellar matter, stellar rotation, and the spectroscopy of the stars and nebulae won him the gold medal of the Royal Astronomical Society in 1944.

Strychnine. Alkaloid prepared from the seeds of *Strychnos nux-vomica* and other species of *Strychnos*. It is a white, inodorous, crystalline powder, almost insoluble in water, with an intensely bitter taste. Strychnine and its derivatives are used in medicine as a stomachic and carminative, to stimulate the flow of gastric juices, and to strengthen the muscles of the intestinal tract. Strychnine is a valuable cardiac stimulant, also a respiratory stimulant, and may be given in cases of bronchitis or pneumonia where the respiration is becoming weak. The alkaloid is an exceedingly poisonous drug.

When a poisonous dose of strychnine is swallowed, an intensely bitter taste is perceived. The person soon becomes restless and apprehensive, and has feelings of impending suffocation. These symptoms are rapidly followed by twitching of the muscles and jerking of the head, passing on to general convulsions, often of great violence. The hands are clenched, the limbs thrown out, the head jerked back, and the whole body

becomes stiff. Convulsions recur, and are followed by relaxation. Periods of remission become gradually shorter until convulsions are almost continuous. The contraction of the muscles of the chest prevents breathing, and ultimately the patient dies.

TREATMENT. If a physician is not at hand, an emetic should be given at once, though sometimes this is not possible if the convulsions have already started. When medical aid has been obtained, the patient should be put under chloroform. The stomach is then washed out with potassium permanganate. Large doses of potassium bromide and chloral hydrate should be administered *per rectum*. Chloroform should be continued as long as there is any tendency towards convulsions. During the remissions between spasms, the patient should be allowed to lie absolutely quiet, as the smallest stimulus, *e.g.* a movement, a noise, or a bright light, is sufficient to start the convulsions. *See Drug*.

Strypa. River of Galicia. Until the First Great War it was in Austrian territory; then it became Polish; and as a result of the Russo-Polish treaty of 1945 after the Second Great War was incorporated in the Ukraine S.S.R. It rises E. of Lvov and flows generally S. to join the Dniester below Bucacz. Battles were fought on its banks between Russians and Austro-Germans in 1915.

Strzelecki, SIR PAUL EDMUND (1796-1873). Anglo-Polish explorer. Of aristocratic birth, he came from Prussian Poland, and was educated in Edinburgh. In 1834 he travelled in the Far East. Visiting Australia in 1839 he explored the unknown interior of New South Wales, completing a survey of the Darling Range and discovering Mt. Kosciusko. In the Wellington district he found gold, but at the urgent request of George Gipps, the governor of N.S.W., who feared the effect of such a discovery on the local pop., he kept his find a secret. Back in England from 1843, he published accounts of his discoveries; became a naturalised British subject in 1850, was knighted 1869, and died Oct. 6, 1873. His name is commemorated in some hills in Victoria, a creek in S. Australia, and by several species among Australian flora and fauna.

Stuart. Alternative spelling of Stewart (*q.v.*), the surname of the later Scottish kings. *See* Charles I.; Charles Edward; James I.; Mary Queen of Scots.

Stuart, LADY ARABELLA (1575-1615). English noblewoman. Daughter of Charles Stuart, earl of Lennox, who

was grandson of Margaret, sister of Henry VIII. Arabella stood next in the succession to James when Elizabeth died. Kept a prisoner at Hardwick, she was made the figurehead



Lady Arabella Stuart,
English princess
After van Somer

of a conspiracy in 1603. She married secretly, 1610, William Seymour, afterwards duke of Somerset (*q.v.*), and with her husband was arrested by James I. Both escaped, but Arabella was retaken near Calais and imprisoned in the Tower, 1611, where she died insane, Sept. 25, 1615. *Consult* Life and Letters, E. T. Bradley, 1889.

Stuart, LESLIE (1866-1928). British composer. Born at Southampton, March 15, 1866, he was educated there, and at 15 was organist at S. John's R.C. cathedral, Manchester. He wrote some of the best light popular music of his day: *Soldiers of the Queen*, Louisiana Lou, *Lily of Laguna*. Of his musical comedies the most famous was *Florodora* (*q.v.*), 1899; others were *The Schoolgirl*, 1903; *The Belle of Mayfair*, 1906. He died March 27, 1928.

Stuart Highway. Strategic road of Northern Territory, Australia, constructed during the Second Great War to link the rly. terminus of Alice Springs with that at Birdum, 621 m. to the N. and 316 m. by rly. to Darwin. The road follows the line of the telegraph as shown in the Australia map facing p. 785.

Stubbs, GEORGE (1724-1806). British painter. Born at Liverpool, Aug. 24, 1724, he studied anatomy and became a lecturer at York hospital. He applied his anatomical knowledge to art, and in 1786 published a monumental work on *The Anatomy of the Horse*, with plates drawn and engraved by himself. Elected A.R.A. in 1780, he died in London July 10, 1806. He was one of the greatest sporting painters, and his works can be seen in the National Gallery and the Victoria and Albert Museum.

Stubbs, WILLIAM (1825-1901). British historian and prelate. Born at Knaresborough, June 21, 1825, and educated at Ripon grammar school and Christ Church, Oxford, he was vicar of Navestock,

Essex, 1850-1866. Returning to Oxford as regius professor of modern history, he remained there until 1884, when he was made bishop of Chester. Five years later he was translated to Oxford, where he died, April 22, 1901.

Stubbs's great book, his *Constitutional History of England*, appeared in three volumes during

1875-78. It takes the story down to 1485, and is one of the most solid achievements that stand to the credit of British scholarship. He also selected and edited a volume of *Select Charters*, which, like the

Constitutional History, has passed through many editions. His ripe scholarship is at its best, perhaps, in the Introductions he wrote to 19 volumes of English chronicles published in the *Rolls Series*. *Consult* Letters, W. H. Hutton, 1904.

Stucco. Cement or plaster used as a facing material on the outside or inside surface of walls, or for the decorative treatment of ceilings. A stucco extensively used by the brothers Adam consisted of about equal parts by weight of stone lime and finely powdered bone ash, with about four times their combined weight of clean sand. *See* Building; Cement; Plaster.

Student Christian Movement. Fellowship founded 1889 of students desirous of understanding the Christian faith and living the Christian life. It is interdenominational and international, and is affiliated to the World Student Christian Federation. It has offices at Annandale, North End Road, London, N.W.11.

Stud Farm. Establishment on which blood-stock, i.e. thoroughbred racing stock, is reared. The breeding of racehorses, now a very considerable industry, originated in England not later than the reign of Henry VIII, whose agents sought out and imported stallions and mares from the stud farms of the N. of Italy and of Spain. The studs were to a great extent dispersed during the Commonwealth. By then, however, there was no lack in the country either of thoroughbred mares or of Arabian or Barb stallions, and from the time of the Restoration there was a steady increase of thoroughbred stock, records of individual stallions and mares being kept.

The General Stud Book, first issued by James Weatherby in



William Stubbs,
British historian

1781 and published continuously since, contained the names of 387 brood mares. Subsequent research traced these and others to 49 authenticated foundation or tap-root mares, from the surviving families of which are traced all contemporary thoroughbreds.

In tail-male, all thoroughbreds descend from three imported stallions: the Byerly Turk (imported c. 1688), the Darley Arabian (imported 1704), and the Godolphin Arabian (imported 1729). From these descend respectively the Herod line, the great line of Eclipse, and the Matchem line. The origins of these male lines are undisputed, whereas the maternal lines, being of an earlier date, do not all hold the same clear titles.

The 387 brood mares recorded in the first vol. of the General Stud Book had increased to 7,904 in 1940 accounted for in Great Britain and Ireland. During the Second Great War a considerable number of mares was weeded out; as a result the annual intake of foals was reduced from a pre-war average of about 4,000 living foals to about 3,000 in 1942.

Accepted Pedigrees

The General Stud Book is not open to either a horse or mare "unless it can be traced without flaw on both sire's and dam's side of its pedigree to horses and mares themselves already accepted in earlier volumes (*i.e.* before Vol. XXII, 1913) of the book."

Stud farms, totalling perhaps 500 in all, are either privately owned establishments, whose owners breed racehorses for their own pleasure; or (a larger number) owned by public or private companies which sell the produce for profit; or (a still larger number) small studs run in conjunction with general farming.

Mares are usually retired to the stud from the age of 3, being mated for the first time at 4 years. After the foals have been born in the spring, the mares are mated again; normal procedure is that the mare, in foal, visits the stallion with whom she is to be mated; her foal is thus born away from her home paddocks, the mating taking place a few days after the foaling. Returning with her foal at foot, she proceeds to wean it until it is taken away from her in the autumn, leaving her free to nourish the new, embryo foal; the gestation period is approximately eleven months.

The stallion, usually standing at a specially equipped stud which he

alone inhabits, or shares with another stallion, holds his court from Feb. to June, when the mating season ends. He normally serves 25-30 mares in his first season at stud—usually at the age of 5 years—and 40 mares thereafter. His stud life may last for 15 years or longer. The produce, born in the following year, are foals; in the next year these become yearlings, then two-year-olds, etc.

The number of stallions at stud in 1945, including those standing at Irish studs, was slightly in excess of 600. Owners of stallions receive fees varying from a few guineas to 400 and even 500 guineas for service per mare served.

Famous studs breeding for public sales of yearlings include the National Stud, situated at Giltown in Dorset. The stud is under the direction of the ministry of Agriculture.

The foals which are bred for public sale are normally kept on the stud farms until their yearling days, having meanwhile been handled or become accustomed to environment outside their paddocks and boxes. The principal sale rings are at Newmarket (July) and Doncaster (Sept.).

The bloodstock industry fund of the animal health trust, formed 1943-44, provides facilities in research, notably into the causes and treatment of infertility and of red worm infestation in the thoroughbred. There is a scientific advisory committee, and research fellowships and scholarships. A Thoroughbred Breeders' association was formed in 1914-15. See Horse Racing.

V. E. Orchard

Studio. Workroom of a painter or sculptor. It is usually a large, lofty room, well lighted from the top and one side, preferably the N. The name is also applied to other workrooms, e.g. a photographic studio. An English monthly art magazine entitled *The Studio* was founded in 1893. It has published noteworthy supplements from time to time. See Art; Sculpture.

Studley Royal. Formerly the seat of the marquess of Ripon. It is 3 m. from Ripon. The house, which was damaged by fire in 1946, is not very notable, but the park, through which the Skell flows, is interesting, while the Dutch and Italian gardens are noteworthy. In the park are the ruins of Fountains Abbey (*q.v.*). The grounds were laid out in the 18th century by John Aislabie.

Stuka. Former German military aircraft. A twin-seater mono-

plane with a fixed undercarriage, the Stuka or Ju 87 was designed and built by Junkers. It was specially designed for dive-bombing and carried either one 1,100 lb. bomb, or one 550 lb. bomb under the fuselage and four 110 lb. bombs under the wings. The fuselage bombs carried swing links to clear the airscrew when released during a dive. The Stuka had a wing span of 45 ft. 4 ins. and a cruising speed of 199 m.p.h. Wing brakes were fitted so that it could dive with precision on special targets, such as aerodrome installations or armoured vehicles. Squadrons of Stukas worked in close cooperation with tank divs. to break up pockets of resistance. See Dive Bomber.

Stukeley, WILLIAM (1687-1765).

An English antiquary. Born at Holbeach, Lincs, Nov. 7, 1687, he studied medicine at Cambridge and S. Thomas's Hospital, London. He helped to found the Society of Antiquaries, 1718, and took holy orders, 1729, becoming rector of S. George the Martyr, Bloomsbury, 1747. Beginning with *Itinerarium Curiosum*, 1724, descriptive of antiquities observed in travel through Great Britain, he wrote many books on his subject. He died March 3, 1765.



William Stukeley.
English antiquary

Stülpnagel, Otto von (1880-1948). German soldier. He held important military appointments under Hitler, and during the Second Great War was military commander of German-occupied France, 1940-42, when he was responsible for ordering the shooting of hostages as reprisals for the killing of German soldiers and officers. During the German campaign in Russia, 1941, he shared with von Reichenau a command on the southern front, and, with the support of von Kleist's panzer divisions he advanced to Kiev, thus enabling the German forces to sweep forward over a wide front beyond the Dnieper. He was arrested by British forces in Germany, 1946, and while awaiting trial as a war criminal in Paris, he committed suicide, Feb. 6, 1948. His cousin, Karl Heinrich von Stülpnagel, who succeeded him as military commander in France, 1942, was implicated in the July plot, 1944, against Hitler and was shot by the Gestapo.

Stump-work. In art, a method of drawing formerly in frequent use with crayon or charcoal. The stump was a short, thick roll of paper, cut to a point, and with it the powdered colour was rubbed to solid tints on the paper. It was also used for softening the hard lines of a pencil or crayon drawing, or for shading.

Stupa. Dome-shaped structure erected over relics of Buddha or his sainted followers, or commemorating Jain or Buddhist events. The name is derived from a Sanskrit word meaning mound. The Hindustani variant, *tope*, is in European use. Developed from the sepulchral tumulus, its domical form was perhaps influenced by the primitive bamboo hut. Superimposed upon a drum, and crowned with a T-shaped finial, it had a processional path enclosed by a rail, with gateways, or torans, at the cardinal points.

Stupor. Partial loss of consciousness. It differs from complete unconsciousness or coma in that the person can still be roused by shouting at him, or by other strong stimuli. The condition is seen in some forms of insanity, poisoning by alcohol, opium, and other drugs, certain constitutional diseases, e.g. diabetes, and certain injuries or diseases of the brain.

Sturdee, SIR FREDERICK CHARLES DOVETON (1859-1925).

British sailor. Born June 9, 1859, he entered the navy 1871, and served in the Egyptian War, 1882, being present at the bombardment of Alexandria as a lieutenant. He was assistant-



British sailor. He was assistant to the director of naval ordnance, 1893-97, and assistant-director of naval intelligence, 1900-02. Chief of staff of the Mediterranean fleet, 1905-07, he commanded the second cruiser squadron, 1912-13.

Sturdee was chief of the war staff, 1914-15, and it was while thus employed that he inflicted defeat on the German squadron of von Spee off the Falkland Islands (*q.v.*), Dec. 8, 1914. In the battle of Jutland (*q.v.*) he commanded the fourth battle squadron. He was commander-in-chief at the Nore, 1918-21, promoted rear-admiral, 1910, admiral, 1917, and admiral of the fleet, 1921. Knighted in 1913, he was created a baronet, Jan. 1, 1916. He died May 7, 1925.

Sturdy (Old Fr. *estourdie*, giddiness). Disease of sheep. It is caused by the presence of a cyst within the brain—a stage in the development of the tape-worm of the dog, the eggs of which are expelled on grass and swallowed by sheep, passing by the circulation to the brain, and there forming the cyst. See Sheep.

Sturgeon (*Acipenser sturio*). Large ganoid fish of the family Acipenseridae. A native of both



Sturgeon. Large fish, known as a "royal fish." All caught in British rivers belong to the sovereign

sides of the N. Atlantic and the principal rivers that open thereon, in the U.K. it is an irregular visitor to the estuaries and sometimes ascends the rivers. It varies usually from 8 ft. to 9 ft. in length.

The skeleton is gristly, not bony, which is partly compensated by the head being encased in hard, bony plates, and these shields are continued in five longitudinal rows along the body. The tail is heterocercal, the upper lobe being of much greater length than the lower. The snout projects far in advance of the small, toothless mouth, and between the two hang four barbules or feelers. The single dorsal fin is placed far back, only a little in advance of the tail. It is a bottom fish, and obtains its food by grubbing with its snout in the sand and mud, obtaining worms and other invertebrates. It ascends the rivers for the purpose of spawning. An Act of parliament of Edward II constituted the sturgeon a "royal fish" belonging to the sovereign; but the lord mayor of London claimed such as were taken above London Bridge.

About twenty species of sturgeon are known, and half the number occur in Europe. The largest (*A. huso*) occurs in the Caspian, the Sea of Azov, the Black Sea, the Danube, etc. Vast numbers are taken to be eaten fresh, smoked, or salted. The roe salted, pressed, and dried forms caviare, and the air-bladder is made into isinglass.

Sturlason OR STURLUSON, SNORRI (1178–1241). Icelandic scholar. Born at Hyamm, Iceland, he was educated at Oddi, where he first became acquainted with the poetry and traditions of the skalds. Having held the supreme magistracy in Iceland, he visited Haakon IV of Norway in 1218, but failed to

execute his promise to conquer Iceland for him. After a stormy career, he was murdered at Reykholt, Sept. 23, 1241, by Haakon's orders.

His literary fame rests chiefly on his masterly prose, especially the *Heimskringla*, a history of the Norwegian kings to 1177; and his collection of the Icelandic sagas known as the Younger Edda. See Edda; Iceland.

Stuttgart. City of Germany, formerly capital of the state of Württemberg. It lies on the Neckar, 125 m. N.N.W. of Munich, in the centre of a flourishing agricultural area. Both its older streets and its modern avenues

and squares had a beauty which was much admired. The town was, however, very heavily damaged by bombing during the Second Great War, and almost all its most famous historic buildings were destroyed. Among its best-known buildings were the Stift church (12th–13th century), S. Leonard's church (15th century), the academy (1746), and the old and new palaces.

Many famous industrial plants were located there, including the Daimler-Benz motor works, the Bosch magneto factory, and various large chemical, optical, leather, paper, and food factories. It has a university, and art and other schools. Known from the 12th century, with urban rights since 1250, it became a residence of the rulers of Württemberg in the 14th century. Many famous Germans of all spheres of activity, e.g. Schiller, Schwab, and Zeppelin, were associated with Stuttgart, by either birth or residence. It was captured by the French 1st army and the U.S. 10th armoured div.,

April 22, 1945. After Germany's surrender it lay in the U.S. zone of occupation and was made capital of the *Land* of Württemberg-Baden Pop. 414,072.

Stuyvesant, PETER (1592–1672). Last governor of New Amsterdam. He was born in the Netherlands, and after serving in the West Indies he became governor of Curaçao, 1635, and in 1646 director-general of New Netherland. During his term he established better relations with the Indians, and seized the Swedish colony of New Sweden in Delaware. After the surrender of New Amsterdam (New York) to the English in 1664, he was for a short time in his native land, but returned and lived until his death on his farm called the Bouwerij (farm), which gave its name to the thoroughfare called the Bowery.

Style. In literature, mode of writing, or manner of expressing thought in language. It is generally applied to the distinctive manner peculiar to an author, or group of authors, or to a particular period or country. The French naturalist Buffon summed it up in the phrase, "the style is the man." Modern English writers regarded as stylists include Ruskin, Arnold, Pater, Stevenson, Alice Meynell, Hilaire Belloc, C. E. Montague, E. M. Forster, Charles Morgan. *Consult* Lectures on Rhetoric and Belles Lettres, H. Blair, 1783; *Miscellanies* (Lecture on Style), S. T. Coleridge, 1818; *Style*, T. De Quincey, 1859; *Style*, Sir W. Raleigh, 1897; *Appreciations*, W. Pater, 1910; *English Prose* Style, H. Read, 1928.

Style (Lat. *stylos*, a column). Botanical term for the tip of a carpel, ending in the sticky or hairy stigma which receives the pollen-grains. In some plants it is absent. See Flower; Pistil; Stigma.



Stuttgart, Germany. Air view of the city, 1945, showing devastation wrought by Allied bombing in the Second Great War

Style (from Gr. *stylos*) is also a name for the gnomon of a sundial. Style (Lat. *stilus*) is the ancient writing instrument for writing on wax-covered tablets: it was of iron or other hard material, sharp at one end for making marks, blunt at the other for obliterating them.

Styptics (Gr. *styphein*, to draw together). Drugs used to stop external bleeding. The more important are adrenalin, ergot, tannic acid, and the per-salts of iron. Local bleeding can also be arrested by applying Russell viper venom.

Styr. River of E. Europe. It rises near Brody, in Ukraine S.S.R. and takes a generally N. course of about 250 m. to join the Pripiet S.E. of Pinsk, in White Russia S.S.R. From 1921 until the Second Great War its course was in Polish territory. When the battles of the Styr in the First Great War were fought, part of its upper course divided Austrian Galicia from Russian Poland. The battles were fought between the Russians and Austro-Germans first in Oct., 1915, when, following the Russians' withdrawal from Lutsk they crossed the river near Polonne and drove the Austro-Germans westward; and again in June, 1916, when a salient of the Austro-German front on the Styr, the apex of which was at Chartorysk, was pinched out and abandoned.

Styrene. Name of an aromatic hydrocarbon, known to chemists from the first half of the 19th cent. In its simplest or monomeric form it is a colourless, lipid liquid, possessing the odour characteristic of the common hydrocarbons benzene, toluene, and xylene, to which it is closely allied. It is in fact vinyl benzene and can be represented as $C_6H_5-CH=CH_2$; it is thus a member of the vinyl family in which one of the hydrogen atoms is replaced by a phenyl group. Monomeric styrene, which boils at $145^\circ C.$, is obtained, though not commercially, in the distillation of coal tar, and as a product in the cracking of oil; and is produced synthetically by the catalytic interaction of ethylene and benzene, via ethyl benzene.

Since styrene possesses the $CH_2=CH-$ or vinyl grouping, it is capable of linking with itself to yield a polymer $(C_6H_5-CH=CH_2)_n$, where n denotes the number of monomeric units which are joined together according to the conditions of the reaction, and may vary between 100 and 200. The polystyrene thus produced is a thermoplastic, i.e. can be softened by the repeated application of heat, and

is much used in the injection moulding process (see Plastics) to make e.g. cups and saucers. Its water whiteness makes it possible to colour the material any desired shade, and transparent or opaque mouldings of great beauty are thus obtained. It is an excellent electrical insulator, and is also used in the production of laminated materials (*q.v.*).

Copolymerised with other vinyl esters, and in particular with methyl methacrylate, styrene gives a thermoplastic of excellent injection properties for dentures and dentines. Copolymerised with drying oils it gives surface coatings far superior in many ways to paint. Together with other readily polymerisable materials such as butadiene, styrene forms the basis of a series of rubber-like plastics (see Rubber: Synthetic Rubber). As a result of the demand for such substances during the Second Great War, the production of styrene in the U.S.A. increased enormously.

dead, round which it was supposed to flow seven (or nine) times. Its waters were poisonous. Styx gives the adj. Stygian. See Charon.

Suakin or SUAKIM. Seaport of the Anglo-Egyptian Sudan. It is situated partly on a coral islet in the Red Sea and partly on the mainland, and is connected by rail with Atbara Junction (308 m. S.W.) and with Port Sudan (47 m. N.N.W.). Before the construction of Port Sudan, Suakin was a commercial centre of some importance, especially for the transport of Mahomedan pilgrims for Mecca, but owing to the natural advantages of the newer port its value has declined. Suakin was occupied by the Egyptians when their power was extended over the Sudan. In the neighbourhood several battles were fought against the forces of the Mahdi. Suakin gives its name to a prov., formerly called Red Sea.

Suarez, FRANCISCO (1548-1617). Spanish theologian and philosopher. Born at Granada, Jan. 5,



Suakin or Suakim, Sudan. General view of the town, formerly an important commercial centre and Red Sea port

Styria. Former duchy and crownland of the Austrian Empire, later a division of the republic of Austria. Extensions of the E. Alps penetrate the country with decreasing elevation. The valleys of the Enns and Mur are fruitful. About half the area is forest and a fifth arable, chiefly devoted to wheat, rye, oats, and barley. Iron ore, lignite, and graphite are important mineral products and give rise to a manufacturing industry in rails, sheet iron, and wire. Graz is the capital, and Leoben, Leibnitz, and Bruck are other towns. In the N.E. the Semmering Pass (*q.v.*) carries the rly. from Vienna. Area, 6,148 sq. m. Pop. 1,085,244. See Austria.

Styrian Alps. Section of the E. Alps in Austria. The range stretches to the N.E. between the valleys of the Mur and the Enns. The Schneeberg at the E. end rises to 6,810 ft.

Styx. In Greek mythology, river of Hades, the abode of the

1548, he entered the Society of Jesus when a student at Salamanca. He became professor of theology at Segovia, Rome, Alcalá, and Coimbra. In 1613 he wrote a Defence of the Catholic Faith, which so infuriated James I of England that he had it publicly burnt. In his treatise *De Legibus ac Deo Legislatore*, Suarez touched upon international law. He died at Lisbon, Sept. 25, 1617.

Subaltern (Lat. *sub*, under; *alter*, other). Word used in the U.K. for a commissioned officer of the army who has not reached the rank of captain. Such are lieuts. and second-lieuts. See Army, British; Commission; Lieutenant.

Sub-Carpathian Russia. Name sometimes given to Ruthenia (*q.v.*) when it was an autonomous unit of the Czechoslovak republic during 1919-38. See Carpatho-Ukraine; Ukraine.

Subconsciousness. Psychological term. It is used by the more academic psychologists to

mean all mental entities below the threshold of consciousness, including that differentiated by Freud as the unconscious (*q.v.*).

Subiaco (anc. *Sublaqueum*). City of Italy, in the prov. of Rome. It is situated on the Teverone, the ancient Anio, 47 m. by rly. E. of Rome. Walls and terraces of one of the villas of Nero are still to be seen on the opposite side of the valley from the three monasteries, the first of which, Santa Scolastica, was founded by S. Benedict in 530. Here in 1465 was printed the first book published in Italy. During the Second Great War one wing, a modern addition, of the Santa Scolastica was destroyed by bombs. The town was shattered during the German retreat of 1944, when a mass of vehicles was trapped in the main street and wiped out by bombing from the air. The 8th army entered Subiaco June 8. Pop. est. 8,000. See Benedict, S.

Subject (Lat. *subjectus*, put under). Philosophical term used in three different senses, as opposed to attribute (predicate), quality, and object. As opposed to attribute, it stands for that of which the attribute is affirmed. The subject is the more important of the two ideas which every judgement necessarily contains. In metaphysics, as opposed to quality, subject is often used as a synonym for substance. In this sense, it is a being regarded as integral and permanent, representing the union in space and time of its manifold and shifting phenomena.

Since the time of Kant, however, subject is more commonly opposed to object. In this sense it is used for the Ego, the thinking subject, the soul which thinks. The subject is the mind that thinks; the object is that about which it thinks. A subjective impression has its origin in the mind itself; an objective impression is due to the observation of external things. Subjective refers to the immediate appearance or impression, objective to that which we recognize from that appearance as appearing in it. In other words, subjective refers to the appearance as such, or to the appearance in its immediate relation to the Ego or thinking subject to which it appears; objective to the knowledge of the appearance or object.

It should be noted that the schoolmen used the terms subjective and objective in an exactly opposite sense. To them subjective meant that which was real, that which belonged to things as

they were in themselves; objective that which was ideal, that which belonged to things according to the manner of their presentation to consciousness.

Subject. In music, a theme or sentence upon which a composition is founded. A fugue subject is generally concise. The subjects in a sonata (*q.v.*) are of greater length, and may comprise more than one sentence, and include several distinct ideas. The earliest form of subject was the Cantus Firmus which, put into long notes, formed the thread on which the composer wove various devices of imitation.

Subjunctive (Lat. *subjunctivus*, joining on at the end). In grammar, the mood of contingency or uncertainty, preceded by a conjunction expressed or understood: were he alive; if it be. In most languages it plays an important part; in English almost the only survivals are *be* and *were*, and it seems likely that even these will eventually disappear.

Sublimation (Lat. *sublimare*, to raise). The passing of a solid substance into vapour without melting. The vapour is similarly condensed by cold direct to the solid state. Sublimation is carried out in vessels made of iron, glass, or earthenware, and the process is employed for purifying various materials, such as iodine, sulphur, naphthalene, ammonium chloride (sal ammoniac), and camphor. Flowers of sulphur is a sublimation product.

In psychology, the term is used to indicate the diversion of mental energies, which might lead to

harmful or anti-social results, into useful channels.

Sublime Porte. This term, formerly used for the govt. of Turkey, is described under *Porte*.

Subliminal Self (Lat. *sub.*, below; *limen*, threshold). In psychology, a term for the subconscious mind, used especially by those who regard it as the fundamental self, of much wider scope than the empirical self of normal waking consciousness. This school, following F. W. H. Myers and W. James, holds that in the evolutionary process only so much has emerged as the practical ends of physical life require, the rest of the personality, unknown to the empirical self, remaining in contact with other minds, drawing energy from a spiritual reservoir transcending individuality, and in certain exceptional persons overflowing and manifesting itself in the hypnotic trance, telepathy, clairvoyance, inspiration, and the intuitions of genius. See Hypnotism: Psychical Research.

Sublingual Gland. Smallest of the salivary glands, lying beneath the tongue on each side. See *Saliva*.

Sub-Machine-Gun. Type of machine gun that can be carried and fired by hand like a rifle or revolver. It may be fed by box or drum magazine and generally fires ammunition of .45 calibre or lower. The first was the Thompson ("tommy") gun introduced in the U.S.A. and used by gangsters and police. In the Second Great War sub-machine guns were adopted by all belligerent armies as weapons for close fighting.

SUBMARINE AND SUBMARINE WARFARE

Francis McMurtrie, Editor, *Jane's Fighting Ships*

The history of the undersea warship called a submarine is here followed by an account of the German U-boat war in the First and Second Great Wars. See Atlantic, Battle of the

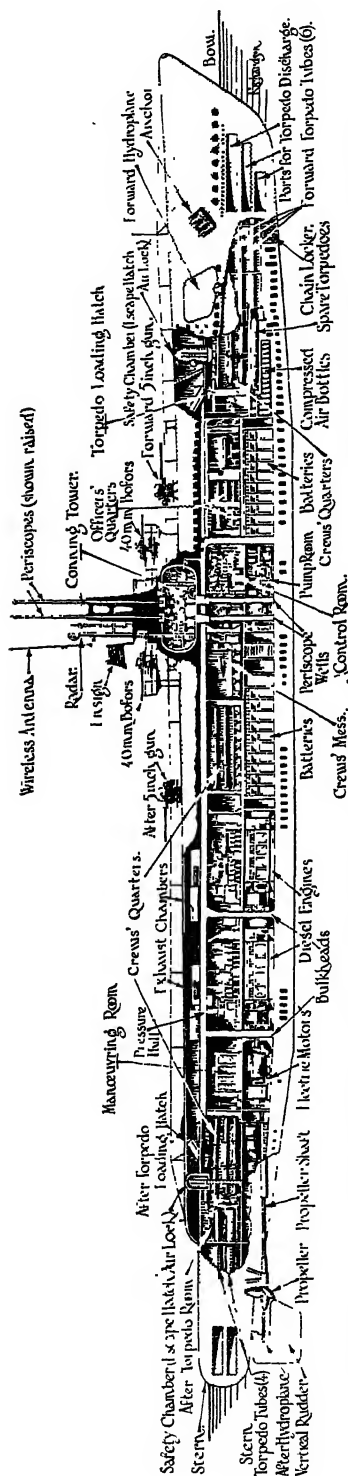
Up to 1945 the submarine could have been defined as a vessel which normally cruised on the surface, but was designed to dive and operate under water when required. This definition is no longer exact. In fact, trials have proved that a submarine can operate submerged for weeks if necessary without ill effects upon her crew.

Streamlining has become an outstanding characteristic of a submarine's hull, which is normally of circular section. To take a submarine beneath the surface, water is admitted into the ballast and trimming tanks until buoyancy becomes negligible, the actual operation of diving being effected

by the use of hydroplanes, or horizontal rudders. When it is desired to return to the surface, water is expelled from the tanks by the use of compressed air, of which a large supply is carried in air bottles made to withstand high pressure.

Diesel engines are the normal method of propulsion on the surface and electric motors below, though experiments with other agents have made progress. Surface speeds have seldom exceeded 20 knots in service, and have often been below that figure. Submerged speeds, which used to be below 10 knots, may well increase until they equal those on the surface.

Auxiliary machinery, such as pumps, air compressors, tele-motor



Submarine. Longitudinal section of a U.S. submarine of the Second Great War showing the interior arrangements for accommodation, navigating, and fighting

gear, etc., take up an appreciable amount of the severely limited space in a submarine. Still more is occupied by the torpedoes and the tubes from which they are discharged; these vary in number according to the size of the submarine. The torpedo is the prime weapon of the submarine, such light guns as may be mounted on the superstructure being merely secondary armament. In the U.S. navy much interest has been aroused by the experiment of launching a guided missile, or rocket, from a submarine.

For some three centuries submarines were the subject of more or less disappointing experiments by inventors. Bourne, in 1578, was probably the earliest of these, though the Dutchman, Cornelis Drebbel, in the reign of James I has often been given the credit of being the pioneer. The first submarine to go into action was devised by David Bushnell, a Yale graduate who in 1776 attempted unsuccessfully to destroy ships of the British fleet off the New England coast by this means. A quarter of a century later another American, Robert Fulton, produced a submarine which failed to win approval from either the British or French government, to both of whom he had submitted it.

During the American Civil War the Confederate navy built a number of semi-submarines called "Davids," which gained minor successes against the blockading Federal fleet. The next notable development was the construction during 1885-91 by the Swedish inventor, T. Nordensfeldt, of six submarines, in designing which he had the collaboration of the Rev. G. W. Garrett, of Liverpool. The first of these was sold to the Royal Hellenic navy, the second to Turkey, the third to Russia. The remaining three were built at Kiel and Danzig to the order of the German navy.

In the decade that followed, substantial progress was made in submarine design, more especially by A. M. Laubeuf in France and by J. P. Holland in the U.S.A. Not until 1902 were the first British submarines placed in com-

mission; these were of American design, built at Barrow-in-Furness. Under the direction of Captain (afterwards Admiral Sir Reginald) Bacon, exhaustive trials were made with these experimental craft, and a much improved design prepared for the "A" type, the first entirely British submarine. One of the important new devices in these submarines was the periscope, for the idea of which Bacon himself was responsible.

In the intervening years before the outbreak of war in 1914, this type was steadily developed and improved until a design that would stand the test of action was evolved. Between 1914 and 1918 submarines of the Royal Navy were successful in destroying 30 enemy warships.

In that war the Germans devoted much energy to the construction of submarines, with which they attacked Allied and neutral shipping. Ignoring all the accepted rules of naval warfare, they torpedoed merchant vessels without warning and left them to founder. The revival of the convoy system, coupled with the provision of larger numbers of escort vessels armed with depth charges and equipped with anti-submarine devices, in the end overcame the menace of the German U-boat.

Experiments with Large Vessels

Immediately after the First Great War there was a short-lived demand for large submarines, the outstanding examples being the British X 1, of 2,425 tons surface displacement; the U.S. Nautilus design of 2,730 tons; and the French Surcouf of 2,880 tons. None of these experimental vessels gave satisfaction in service, and vessels of moderate dimensions continued to be preferred.

Between the wars British submarines developed from the "L" class of 845 tons, armed with six torpedo tubes, to the "T" class of 1,090 tons, with either nine or eleven tubes. Similarly, the U.S. navy progressed from the 850-ton "S" type, with four tubes, to the Gato type of 1,525 tons with ten tubes.

During the same period the Germans were precluded by treaty from building submarines. They contrived, however, to maintain close touch with submarine design, their experts being responsible for various building projects in other countries.

In the Second Great War the German submarine onslaught was even more formidable than it had been 20 years earlier. Starting with the sinking of the liner

Athenia on the first day of hostilities, the conflict with the U-boats raged for 68 months, during which 2,775 British, Allied, and neutral merchantmen, aggregating 14,500,000 tons gross, were destroyed. Lives lost in these vessels numbered about 35,000.

Both sides began the war better prepared than in 1914. The Germans had 57 submarines of up-to-date design, with more nearing completion; but the British asdic detection device had been considerably improved since 1918 and was installed in most destroyers and escort vessels. No time was lost in instituting a system of convoy; but there were never enough escorts to meet all the demands, in spite of the extensive building programmes that were put in hand, putting under the control of the Admiralty by 1944 as many as 880 asdic-fitted vessels engaged on ocean convoy work.

Effect of French Capitulation

Up to June, 1940, the submarine attack was held in check, but with the capitulation of France the western European coastline from Tromsø to Bordeaux came under German control, providing numerous bases on the flanks of the British Isles and the Atlantic convoy routes. At the same time that the attackers were reinforced by about 100 Italian submarines, the defence was weakened by the French navy's withdrawal and Great Britain's severe losses in destroyers at Dunkirk. Thus for the ensuing 18 months the Royal Navy had to contend single-handed with the U-boats, which soon adopted novel tactics to baffle the asdic device. Shadowing a convoy at extreme range during the day, they would close in on the surface at night, fire their torpedoes, and escape at full speed, only diving in emergency. This technique was developed into the so-called "wolf pack" system, by which a whole flotilla of U-boats would be concentrated on a convoy after dark. As a countermeasure, escort vessels were fitted with radar for the detection of surfaced U-boats. Later, as an additional defence measure, some merchant vessels were equipped with a catapult and a single-seater fighter for use in emergency. Once flown off, however, the aircraft could not return to the ship. In due course a number of tankers were fitted with flight decks so that they could carry aircraft which could be flown off and back again. Both measures were temporary expedients, pending completion of an adequate number of escort carriers.

The main Axis concentration was observed to move farther west across the Atlantic; this made interception by escort carriers more difficult, few having the necessary fuel endurance. A number of escort carrier groups and Coastal Command squadrons were based in Iceland; but there was still left in mid-Atlantic a gap which could not be covered by long-range aircraft from the British Isles or Canada.

With the entry of the U.S.A. into the war in Dec., 1941, the U-boats were presented with a fresh field of operation off the American E. seaboard: Jan. to July, 1942, casualties in this area amounted to 495 ships of over 2,500,000 tons gross, including 142 tankers of more than 1,000,000 tons. In the same period 42 German and Italian submarines were lost.

New devices introduced about this time included the hedgehog, a spigot mortar firing ahead of a ship a salvo of 24 depth charges, each containing 32 lb. of explosive; and the Leigh light, by the use of which, in conjunction with radar, aircraft could sight and attack U-boats on the surface at night.

The ten months from Aug., 1942, to May, 1943, saw the peak of the enemy effort and foreshadowed its final defeat. German submarines were built faster than they could be destroyed, and there were usually from 80 to 100 at sea at one time. Very long-range aircraft were now able to carry out attacks on U-boats 600 m. from their bases. This helped materially to break up the "wolf packs," though merchant losses continued heavy.

The destructive effect of depth charges was increased by the introduction of a new explosive, minol, which could crack the pressure hull of a U-boat at 25 ft.

Attempt to Nullify Radar

In an effort to nullify Allied radar, the Germans had equipped their submarines with a device known as a search receiver; but British scientists very soon effected a modification in the radar equipment of escort vessels and aircraft which successfully overcame this obstacle.

Early in June, 1943, the U-boats, dismayed by heavy losses, had virtually been withdrawn from the N. Atlantic convoy routes, though some 80 were still at sea. U.S. escort carriers, whose aircraft delivered a number of successful attacks, helped to fill the mid-Atlantic gap. Though the A.A. armament of the U-boats had been materially augmented, little was gained by this. Close cooperation

between surface escorts and aircraft had yielded such excellent results that these tactics were now extended to deal with U-boats on passage to and from Biscay ports.

In Sept., 1943, the Germans resumed attacks on Atlantic convoys with the aid of a new weapon. This was the acoustic torpedo, which "homed" on to its target by the noise of propellers. All German submarines were provided with three or four of these weapons, the idea being to use them to destroy the escort vessels and then use ordinary torpedoes against the merchant ships. With British acquisition of bases in the Azores in Oct. the gap in mid-Atlantic was really closed, and the strength of anti-submarine sea and air defence became so great that Oct. saw the last large scale "pack" attack. So difficult had it become for U-boats to avoid detection by radar when they came to the surface at night to recharge their batteries that the Germans adopted a breathing device called the schnorkel (*q.v.*), eventually fitted to all U-boats, which made their detection from the air almost impossible.

Heavy U-Boat Losses

In the first six months of 1944 the enemy lost 122 submarines. No effective interference from U-boats was experienced during the Normandy campaign. Later in the year another new anti-submarine weapon was brought into service: the squid, a three-barrelled mortar firing with great accuracy a pattern of large charges ahead of a ship.

The bulk of the German submarine effort was maintained by vessels of two types, the smaller displacing from 626 to 753 tons on the surface and the larger more than 1,000 tons. Maximum surface speed of the former was 16-17 knots, with an extreme range at low speed of 11,000 m. Corresponding figures for the larger type were 18 knots and 15,000 m. These ranges could be and were extended indefinitely by the use of supply submarines of larger size.

Towards the close of the war the Germans produced a 1,600-ton submarine with a streamlined hull designed to operate almost continuously submerged, in which condition the maximum speed was about 15 knots. Though 120 of these were built before the war ended, very few of them had gone into operation at the time of the German surrender.

In the closing months the number of merchant vessels lost each month was frequently exceeded by the total of U-boats destroyed. In

Feb., 1945, there were still 60 German submarines operating, mostly based on Norwegian ports. In May, the month of surrender, three ships were sunk by U-boats, but 25 of the latter were lost, mostly through Coastal Command attacks.

From first to last 778 German submarines were destroyed out of a total of 1,155 completed. The Italians lost about 100, several of which had previously fallen into German hands. Japanese submarine losses totalled 131. These figures exclude submarines of the midget category, which in enemy hands had little success.

During the war the Japanese built three submarines of about 5,000 tons, with a speed of 21 knots. No useful purpose was served by these huge vessels, which fell into American hands at the surrender. In general, Japanese submarines failed to accomplish much, whereas those of the U.S. navy scored many successes, ultimately wiping out the greater part of the Japanese mercantile fleet.

Typical post-war submarine types included the British "A" class, of 1,120 tons displacement, armed with 10 torpedo tubes. Surface speed was 18 knots, and the "snort," a British adaptation and improvement of the German schnorkel device, was included in the equipment. Construction was all-welded. Later came the U.S. Tang type, reported to displace 2,000 tons and to embody various improvements due to war experience, including a type of propulsion expected to give higher underwater speed. Another novel American type was specially designed and equipped for hunting enemy submarines.

Submarine Canyons. In geology, deep valleys entrenched in the slope connecting the continental shelves with the ocean depths. Such canyons are comparable in size with the biggest land valleys, having depths up to 4,000 ft.; some have been traced to 10,000 ft. below sea level. They are known to be of fairly recent formation, because Pliocene rocks have been dredged from their slopes. Their origin is still debated.

Submaxillary Gland. Salivary gland situated on the inner side of the angle of the lower jaw on each side. *See* Saliva.

Submerged Forests. Remnants, usually roots and stumps, of old wooded areas covered by the sea. They are visible only at low tide, and afford evidence of recent movements of land rela-

tive to the sea, or vice versa. Examples can be observed in several localities around the British coast, e.g. Cheshire and Lincs.

Submerged Tenth. Term used by William Booth (*q.v.*) in his book *In Darkest England*, 1890, to describe the hopelessly destitute class of society whose number Booth estimated at one-tenth of the population of Great Britain. Primarily to assist them through spiritual and practical guidance, he founded the Salvation Army (*q.v.*).

Sub-ordinaries. In heraldry, conventional symbols, simple in form like the ordinaries (*q.v.*) but of secondary importance. Seven of these are generally recognized: (1) the gyron (*q.v.*); (2) the fret (*q.v.*); (3) the inescutcheon; (4) the border, a broad band round the shield; this has two diminutives, the orle (*q.v.*) and the tressure, a smaller orle and generally borne in couples, one within the other; (5) the pall (*q.v.*) or pallium; (6) the flanche (*q.v.*), with its diminutives the flasque and the voider, respectively half and a quarter the size of the flanche; (7) the lozenge. *See* Heraldry colour plate.

Subornation (Lat. *sub*, under; *ornare*, to provide). Crime of procuring another person to commit an illegal act. As a legal term it is virtually restricted to subornation of perjury—instructing or inducing another to give false evidence on oath; an offence involving the same punishment as perjury itself.

Subotica (Hung. Szabadka). Town of Yugoslavia, formerly in Hungary. It is the largest town and the chief rly. junction in the Bačka, the dist. between the Theiss and the Danube, which passed from Hungary to Yugoslavia by the treaty of Neuilly, 1919. It is the centre of the richest cereal-producing dist. in the country, and has considerable trade in horses and swine. Belgrade university has a law faculty here. Linens, leather, and boots and shoes are manufactured. Pop. 100,058. *Pron.* Soobotetsa.

Subpoena (Lat., under a penalty). Writ issued out of a court of justice, commanding the person to whom it is addressed to be present in court at such a time, under a penalty if he fails to comply. It is used now only as a means of compelling the attendance of witnesses, and such a subpoena is called *subpoena ad testificandum*. A *subpoena duces tecum* is a writ ordering a witness to bring to court documents or other things in his possession. Disobedience to

a subpoena is generally punished by a fine.

Subrogation. In law, the substitution of one person or thing for another. It is specially used in connexion with insurance contracts taken over by an underwriter. He is subrogated to the insured, i.e. is entitled to everything that would fall to the insured person under the contract. A variant of subrogate is surrogate (*q.v.*). *See* Insurance; Substitution.

Sub Rosa (Lat., under the rose). Privately, or in strict confidence. The rose was a symbol of silence, and was carved on confessional boxes, and also on the ceilings of banqueting halls, where it is said that it indicated that guests should not repeat incautious utterances made under the influence of wine.

Subsidence. Term used in geology for the sinking of portions of the earth's crust. Such movements take place from a number of causes, e.g. erosion and weathering of rock masses, which slowly bring into play, due to unequal distribution of land, forces great enough to bring about a warping of the earth's crust. Such subsidences are constantly taking place on a large or small scale. The land is slowly subsiding on the W. coast of Greenland, on the Italian coast near Naples, and on the E. coast of N. America. Smaller scale subsidences are the result of solution at depth, e.g. of limestone, causing collapse of the surface. Subsidence may also occur above coal or salt mines. The term is also used in meteorology to denote the slow downward movement of air from the upper layers of the atmosphere. *See* Erosion; Geology; Rift Valley; Rock.

Subsidy (Lat. *subsidiūm*, aid). A payment of money to support a person or a project. Originally, when the expenses of government were defrayed out of the king's income, subsidies were votes of money to the king by parliament; until the reign of Edward III the chief business of parliament was to vote such subsidies. (*See* Tonnage and Poundage.) From early times the word was also applied to aid given by one country to another. Thus Afghanistan was for many years subsidised by Great Britain to secure her neutrality. During the First Great War, Great Britain subsidised many of her allies; subsequently she subsidised the White Russians. During the Second Great War many subsidies took the form of

Lease-Lend (*g.v.*). After the war the U.S.A. continued to subsidise European recovery.

The principal use of the word subsidy in the 20th century has been to denote payments from govt. funds, *i.e.*, taxation revenues, to support economic or social policy, particularly payments to encourage the production of certain commodities or to maintain prices at a desired level. Thus in Great Britain from 1933 subsidies were paid to encourage production of milk, and of better quality milk, and the increased drinking of milk, especially by school children. Similarly the production of beet sugar, fat cattle, coal, and other commodities was subsidised before 1939. During the war the production and marketing of commodities, particularly food-stuffs, were controlled centrally; most subsidies took the form of payments to cover the difference between the prices guaranteed to producers and those charged to consumers. In this way the cost of living was subsidised in a largely successful attempt to avoid inflation. Food subsidies cost about £400,000,000 during 1948-49. Most British subsidies are paid out of taxation revenue; but some, such as those for housing, are normally met partly out of local taxation, *i.e.*, rates.

Substance (Lat. *sub*, under; *stare*, to stand). In philosophy, that which has a permanent, independent existence contrasted with its accidents (inessential qualities), which are variable, and have no independent existence. Substance, then, will mean that which supports the accidents, makes their existence possible; in reference to its permanent existence, the word is sometimes derived from *subsistere* (to subsist). The chief views of substance are: (1) Since nothing is permanent, the idea of substance is a pure fiction. (2) There is an absolute, infinite substance, of which all beings are only "modes" (Spinoza). (3) There are no sensible substances, the world is known to us only by the action of God on our mind. Substance is not a separate thing over and above phenomena, but a simple form of thought applied to the myter of knowledge, the reality of which, however, we cannot affirm, since such an affirmation would transcend the limits of experience. The category of substance expresses only the necessary connexion of phenomena in space and time; beyond the phenomena, substance is an un-

known quantity (Kant). (4) Substances are only permanent bundles of impressions (Hume, Mill).

Substantive Rank. In the British army, military rank which counts for pay and pension, as distinguished from brevet or honorary rank. *See* Officer.

Substitutions. In mathematics, the theory of the replacement of a set of algebraic variables by another set connected with the first by a system of equations equal in number to that of the variables in either set. The theory, which belongs to the domain of higher mathematics, has many important applications, especially in projective geometry and methods of analytical treatment of curves and surfaces. By means of the theory it was shown that the quintic or equation of the fifth degree could not in general be solved. *Consult* Theory of Groups of Finite Order, W. Burnside, 1911; Homogeneous Linear Substitutions, H. Hilton, 1914.

Subway. Construction underneath the main arteries of traffic in large cities for sewers, gas and water pipes, electric light, telephone and telegraph cables, etc., also for foot passengers. A subway has a cross-section of sufficient size to give plenty of room for workmen, and is provided at intervals with entrances and ventilating shafts.

Another form enables foot passengers to pass under streets at points where traffic is congested, or gives communication between rly. stations, and the platforms of a big station.

A subway for electric trams runs from Southampton Row to the Embankment, London. The New York underground rly., which is commonly called the subway, runs the whole length of Manhattan Island and passes under the East river to Brooklyn. *See* Bank; Blackwall; Greenwich; Railways; Rotherhithe; Tunnel.

Succession (Lat. *succedere*). Literally, to go up and therefore to follow. It is applied to the act of ascending a throne when in accordance with the laws governing such an event. In the United Kingdom this is regulated by the Act of Settlement (*g.v.*). Legally it means the taking of property which comes to one on the death of another. The duties levied in the United Kingdom and other countries, including the U.S.A., on such property are called legacy or succession duties. The term is also used for the assumption of a title owing to the death of

the previous holder, and in other related senses, *e.g.* the succession or rotation of crops. *See* Apostolic Succession; Death Duties; Legacy Duty; Primogeniture.

Succession Duty. Duty formerly payable in the U.K. on property which passed from one person to another upon death. It was payable whether the transfer was by gift or by inheritance, but was not payable where the estate was liable to legacy duty. The rate at which succession duty was paid depended on the relationship between the person succeeding and the predecessor. Where the successor was the husband, wife, descendant, or ancestor of the predecessor the rate was 2 p.c.; if brother, sister, or descendant of brother or sister, it was 10 p.c.; for more remote relations it was 20 p.c. Succession duty was abolished in 1949 in respect of deaths after July 29, 1949.

Succinic Acid (Lat. *succinum*, amber), (CH₂COOH)₂. Solid acid, usually prepared by the dry distillation of amber, or made by fermenting ammonium tartrate. In the former process amber is subjected to dry distillation in a retort, when it is decomposed into amber oil (spirit of amber), amber resin, and succinic acid. The last named is a yellow-coloured crystalline substance. The salts of succinic acid are known as succinates, and are used in medicine. *See* Amber.

Succoth (Hebrew, booths). Name applied to the first camping place of the Israelites when they left Rameses, and also to a resting place of Jacob near Shechem. The name is also applied to the Jewish feast of tabernacles, which is celebrated at a date falling in Sept. or early Oct.

Succulent Plants (Lat. *sucus*, juice). Plants whose leaves and shoots, sometimes the entire plant, are swollen because their tissues store up great quantities of fluid. Such a condition denotes that the natural habitat of the plant is either the desert, dry rocks, or the sea-shore. In the desert, where rain falls only at long intervals, perennial plants could not survive if they had no means of storing moisture, which they absorb in quantity during the rainy period. Their cuticles are leathery, and permit little evaporation. Examples are afforded by the Cactaceae, some of the euphorbias, agaves, and aloes. Rock-plants such as sedums and sempervivums are subject to similar conditions, because their roots have little soil, which rapidly dries up. *See* Botany; Plant

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